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GENDER INTEGRATION IN THE MILITARY:
PRESENTATIONS GIVEN AT THE NAVAL
POSTGRADUATE SCHOOL

by

Richard S. Elster (Editor)

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NAVAL POSTGRADUATE SCHOOL

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In an attempt to identify manpower, personnel, and training policy issues and research and development requirements associated with changes in the numbers and roles of women in the Navy, experts in various disciplines were asked to address the issues they saw as pertinent to an increased participation of women in the Navy. During 1978 and 1979, these experts delivered their views in oral briefing sessions with officers representing each of the branches of the United States armed forces, including the Coast Guard, at the Naval Postgraduate School, Monterey, This report provides tape-recorded transcripts of these sessions, edited for publication.

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FOREWORD

In an attempt to identify manpower, personnel, and training policy issues and research and development requirements associated with changes in the numbers and roles of women in the Navy, experts in various disciplines were asked to address the issues they saw as pertinent to an increased participation by women in the Navy. These experts delivered their views in oral briefing sessions with officers representing each of the branches of the United States armed forces, including the Coast Guard, at the Naval Postgraduate School, Monterey. The tape-recorded transcripts of these sessions, including questions from the audience, were edited for publication. The final version of this report was revised and updated (via footnotes) to reflect mid-1981 realities by Captain Yvonne M. Dupes, USN, Coordinator, Women in the Military, Office of the Assistant Secretary of Defense.

The results of this effort are intended for use by Navy managers responsible for developing and implementing policies and by Navy research and development funders and producers. They should also be of interest to the other services and to the Defense Advisory Committee on Women in the Services (DACOWITS).

Any errors in this report are solely the responsibility of the editor.

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INTRODUCTION

Problem

Because of the introduction of the all-volunteer force in 1973 and the low birth rate in the United States in the 1950s and 1960s, it has been increasingly difficult for the armed forces to meet their manpower requirements. For instance, as of January 1980, the Navy had not met its overall recruitment goal in 37 of the previous 42 months. The effects of the end of the draft and the relatively low birth rates of the last 20 years are exacerbated by increased competition for high quality personnel by colleges and civilian employers. In addition, changing social and economic factors have led an increasing number of women to pursue employment.

Because of these changes and trends, the number of women in the armed forces has more than tripled in the last 5 years, and women now constitute over 6.6 percent of active duty Navy personnel. A 1978 amendment to Section 6015, Title 10 of the U.S. Code allowed the Navy to assign women to certain noncombatant ships and temporarily to combatants not expected to be in combat. The total number of active duty officer and enlisted women in the Navy is expected to increase from about 26,500 in 1979 to approximately 47,700 by 1983. By the end of fiscal year 1980, 131 women officers and 771 enlisted women were serving aboard a total of 28 ships; by the end of 1985, the Navy plans to have 190 women officers aboard 60 ships, and 4940 enlisted women aboard 35 ships.

Further increases in the numbers and roles of women in the Navy are possible if the Equal Rights Amendment (ERA) is ratified, or if Congressional legislation is enacted to make differential employment policies unlawful. As this report was being completed, military registration for 18- to 26-year olds had been reinstated, and a court decision concerning the registration of women was being appealed in the Supreme Court. Increases in the number of women and the numbers and types of jobs they perform in the Navy require Navy policy-makers to identify and deal with a number of new issues and additional research requirements.

Purpose

The objective of this effort was to identify manpower, personnel, and training policy issues as well as research and development requirements associated with increases in the numbers and roles of women in the Navy.

Approach

Experts representing various disciplines gave presentations at the Naval Postgraduate School, Monterey, CA concerning women in the Navy to groups of officers representing all of the United States armed forces, including the Coast Guard. The format for the presentations was designed to encourage audience questions and reactions to the speakers. The presentations were tape-recorded and transcriptions made from the recordings. Summaries of the transcriptions, which were edited to increase readability and reduce their lengtn, are provided in the following paragraphs.

Overview of Women in the Armed Forces

The first presentation provided in this report was given by CDR Richard Hunter, USN (Ret.). Hunter was, at the time of his presentation, assigned to the Office of the Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics). He is currently Assistant Director for Planning and Program Development, Office of Personnel Management.

Hunter described some of the problems and opportunities arising from the increased number of women in the military. An important point raised by Hunter is that, as additional military jobs and occupations are opened to women, they will be assigned in accordance with service needs. If, for instance, combat assignments are opened to women, assignment to these jobs will be based upon service needs rather than upon "let her do it if she wants to."

Hunter also reviewed plans for increasing the numbers of women in the military. He pointed out that plans are very much contingent upon public attitudes and the laws governing the use of women in the military.

The second presentation was given by COL Trevor Dupuy, USA (Ret.). Dupuy is the author of several dozen volumes on military history. Additionally, as an operations researcher, he has attempted to unravel the variables related to effectiveness in ground combat.

Dupuy concentrates upon ground combat. He points out that history will teach us very little about the effectiveness of women or mixed-gender units in ground combat, because women have so rarely been involved in combat. In a review of factors contributing to the outcomes of ground combat engagements, Dupuy argues that intangible factors such as morale and leadership are usually much more important in success or failure in combat than are technological and other factors. After reading Dupuy's presentation, the reader may agree with the editor in thinking that, since little is known about ground unit combat effectiveness and since history teaches us practically nothing about the effectiveness of women or mixed male-female groups in this situation, it is impossible to predict performance of mixed-gender units. If this conclusion is accurate, the services should conduct research on mixed-gender combat units prior to adopting a position concerning them.[1] Dupuy did not address the state of knowledge concerning factors influencing the combat effectiveness of sea and air units. This editor suspects that (1) technological factors are more important in air and sea combat than in ground combat, (2) human and organizational factors are important in air and sea combat effectiveness, and (3) research is needed to identify and define the effects of factors related to air and sea unit combat effectiveness.

Current Programs and Evaluation

Three presentations provided views concerning progress and problems in the integration of women into the armed forces.

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[1]The Army has investigated the effectiveness of women in combat support units (e.g., MAX WAC and REF WAC), but not in combat units.

CAPT Joseph McDonough, USCG, Commanding Officer of the 378-foot, high-endurance Coast Guard Cutter MORGENTHAU, provided an encouraging view of the performance of his gender-integrated crew. (MORGENTHAU has a crew of 15 officers and 139 enlisted personnel.)

Ms. Cecile Landrum, a manpower analyst in the Headquarters of the U.S. Air Force, emphasized that gender integration is raising many issues that are not simply a question of whether or not women can do the job but, instead, stem from the impact of the military family upon the military mission, and vice versa. Landrum also raised a number of questions concerning the accuracy of the expectations of women entering the military.

Ms. Patricia Thomas, Navy Personnel Research and Development Center (NAVPERS-RANDCEN), provided data concerning the integration of women into the Naval Academy, and the reactions of men and women as women moved into the Navy. Among the interesting data reviewed by Thomas are the results of a study concerning time lost from duty by male and female Navy enlisted personnel.

Physiological Considerations

Professor M. Ayoub, Texas Tech University, and Dr. David Robertson, NAVPERS-RANDCEN, discussed a number of topics and studies related to the physical requirements of military jobs and to the physical work capacities of males and females. Ayoub and Robertson both provided data summarizing some of the sex differences in scores on physical strength measures. Ayoub showed data demonstrating that, as an average over a number of separate physical strength measures, an average woman can be expected to have about two-thirds the strength of an average man. Both Ayoub and Robertson remind the reader to consider the distribution of male and female scores because, when distributions are considered, most men will receive scores exceeding the score of the strongest female. In a hand-grip strength measure, for instance, Robertson found that only 20 percent of the women tested had grip strengths equal to or exceeding those of the man with the weakest hand-grip. The practical importance of sex differences in physical strength cannot be assessed without a knowledge of the physical strength requirements of military jobs. Unfortunately, as Ayoub and Robertson point out, little is known about these requirements.[2]

Psychological Considerations

Psychological sex differences and similarities are discussed in the presentation given by Professors Maccoby and Jacklin of Stanford University. Maccoby and Jacklin remind us that to say there is a sex difference is not to say that the difference is necessarily biologically determined or that it cannot be eliminated. Rather, it is referring to a difference between male and female averages, with the danger we will forget that, on most measures, males and females obtain very similar scores. To illustrate this point, Maccoby and Jacklin remind the military that, although the average male is more aggressive than the average female, many females could be more aggressive than some males. Unless the military selects males for aggressiveness, the services should not

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[2]The U.S. Air Force is addressing the strength and stamina issue by developing occupational standards, based on validated criteria, for use in assigning personnel to occupational specialties.

exclude women because they are stereotypically viewed as less aggressive than men. Maccoby and Jacklin also provide the reader with three lists: (1) unfounded beliefs about sex differences, (2) fairly well established sex differences, and (3) unsettled questions concerning sex differences.

Sociopsychological Considerations

The final two presentations were given by Dr. David Bowers, University of Michigan, and Dr. John Collins, who, at the time of his presentation, was a consultant to NAVPERS-RANDCEN. Bowers and Collins addressed sociopsychological, leadership, and unit interpersonal relationship considerations relevant to gender integration of the Navy. Their presentations should convince the reader that interpersonal, unit, and teamwork phenomena must be viewed as important variables to be addressed when considering gender integration.

Dr. Bowers raised a provocative argument. He asserted that the military has taken the main themes of masculine identity and built an entire work society on that identity. If Bowers is correct, integration of women into the military, particularly into combat positions, may be psychologically threatening to males. Bowers argues further that the role of "Mom," as defined in our society, is not compatible with the sort of role filled by military males--a role that is compulsory and well-ordered, and a role to which everything and everyone else is subordinate.

Dr. Collins, in a review of research literature concerning mixed-gender work groups surfaced some problems that will be faced by the military. Men and women in mixed groups still see themselves in the traditional and stereotyped sex roles, and men and women tend to value masculine characteristics more highly than they do feminine characteristics. Collins identified sex differences regarding individuals' reactions to close supervision and reluctance to assume leadership positions as other possible phenomena that will have to be dealt with by the military services.

Potential Policy and Research Issues

The final section of this report was prepared by the editor. It suggests a number of potential policy and research and development issues that should be considered by the services as gender-integration decisions unfold.

PLANS FOR THE UTILIZATION OF WOMEN IN THE MILITARY

Richard Hunter, CDR, USN (Ret)
Office of the Assistant Secretary of Defense
(Manpower, Reserve Affairs, and Logistics)
Washington, D.C.

When Secretary Brown was named Secretary of Defense, he asked for a series of studies, including one on "Use of Women in the Military" (DoD 1978). The purpose of this study was to find out how many women the armed forces employed and could employ. We asked the services to categorize jobs in which women could not serve. One of the most fascinating findings of this study was the answer the services provided: None of them excluded women from any job for physical strength reasons.

Question: Has there been any rethinking about that?

Answer: Well, there aren't very many physically demanding positions that do not already exclude women for another reason. A number of people would argue, I think, that Army riflemen jobs probably have a physical requirement for upper body strength that exceeds most women's capabilities, but women are already excluded from those jobs because of the exclusion of women from combat jobs. Figure 1 gives you the projection of numbers of women in the services.[3] The numbers through 1978 are actual. Those through 1984 and beyond are expected to continue upward. About one out of every six members of the Air Force will be a woman by 1984. The Army wants to level off in FY 1985. That will be an issue next year, whether DoD will let the Army level off at about the 80,000 level or not. Figure 2 shows the percentages of women in the nonprior service accessions. Figure 3 shows that the number of women accessions is going to continue to grow, but that the Army is planning on coming down in 1984 and down again in 1985.[4]

Question: Will the number of Navy women accessions also dip in 1983?

Answer: Well, the Navy program is going to change, one way or another, I think. The Navy has a legal exclusion of women from combat ships. That is the driving constraint in the Navy--not only a constraint on the sea side, but also on the shore side because of sea-shore personnel rotation requirements. The Navy must either expand sea duty opportunity or restrict female accessions.

Figures 4 through 7 display data concerning numbers and percentages of women officers. The total number of women on active duty is shown in Figure 8. You can see that we will be up in the 235,000 to 240,000 range by the end of the next 5-year period. Figure 9 shows women as a percentage of the force. You see, we are talking about women being in the neighborhood of 11 or 12 percent of the force by 1984. In the Air Force, women will be over 16 percent of the force.

Question: Is there a legal constraint on use of women in the Air Force?

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[3]Because of the large number of figures used in this presentation relative to the amount of text, the figures are provided at the end, beginning on page 13.

[4]As of October 1980, the Army planned that goals for female enlisted personnel would rise, in both 1984 and 1985.

NOTE: Dr. Hunter is now at the Office of Personnel Management, Washington, D.C.

Answer: Yes, they have a legal restriction that precludes women from serving in the crew of combat aircraft on combat missions. It is not as restrictive as the Navy's constraint, but we will have to wait and see what happens in Congress.[5] This is a strange issue. In general, the usual friends of defense in the Congress are on the other side of this issue, and the usual foes of defense will be DoD's big supporters in seeking the changes in the laws restricting women.

Figure 10 shows the 3-year moving average of numbers of 18-year old females. You can call that a supply line if you want. Figure 10 also shows the demand line. Even with this increase in the accession of women, we are still just barely dipping into this market. Figure 11, which displays the average pay for a male civilian, noncollege individual and a comparable female, as well as the military pay scale, shows one of the reasons why we are pretty confident that we can recruit women.

Question: What is included in the military pay figures used in Figure 11?

Answer: The cash elements of Regular Military Compensation (RMC), with no tax advantage counted.[6]

Figure 12 is normally used outside of DoD to prove that we discriminate against women in the military. The women's profile does not look like the male profile in Figure 12, does it? What needs to be remembered is that the services have recently increased the numbers of women recruited. In our system, we hire very few laterally. So, Figure 12 is not too good a way to look at relative pay grades, although this was the traditional way that was being used when I undertook the study. Now hold years of experience constant, as shown in Figure 13, and you can see that there is not a whole lot of difference between male and female pay grades.

The male-female pay grade distributions are being monitored, partly because of some Army experiences. The Army found they were having promotion problems in some units. Women were being promoted at higher rates than men. Remember, a woman can't enlist in the Army unless she's got a General Classification Test (GCT) score of 50. Men are coming in with GCT scores as low as 10.[7] So, in a lot of the combat support units, you are getting units with men scoring in the 10-40 range, and a sprinkling of women in the 50-100 GCT range. The result is that the women are more likely to pass the tests, and more likely to get promoted, so the men think that there is reverse discrimination. The women also tend to move in and take over the jobs that are more responsible. In a motor pool, first thing you know, the women are the dispatchers--the women are running the motor pool. The Army is working on not having that kind of problem. It is trying to keep an even promotion balance. It has worked very hard to try to get the men to pass tests.

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[5]The Secretaries of the Navy and Air Force have combat duty constraints set by law (Title 10 USC 6015 and 8549) that hamper full utilization of women. The Secretary of the Army does not. In May 1979, DoD asked Congress to repeal these laws to give the Navy and Air Force the same flexibility for force management as the Army has. The House held hearings in November 1979, but took no action. DoD has submitted the same proposal to the 97th Congress.

[6]RMC has three elements: basic pay, cash allowances (or in-kind equivalent), and a tax advantage.

[7]Army policy has subsequently been changed to have the same entrance scores for men and women.

Let me show you promotion data in a little different manner. I keep hearing that women get promoted, but only in clerical skills. Figure 14, which provides average pay grades for males and females in a number of DoD occupational code groups shows that, in the third year of service, women are more likely to have been promoted than men in all of the skills. Now, if you hold education and mental quality constant, it turns out that men have slightly better percentages than the women.

Let's look at loss rates for just a minute. Figure 15 shows active duty nonmedical officer loss rates by calendar years. Notice that the rates are coming down and that the women's loss rates are slightly higher than those of the men. Figure 16 shows the distribution of losses over years-of-service. Women are bailing out in the ninth or tenth year. What is the reason for that? I think, but I have no documentation to prove this, that there is a significant number of women who say, "This isn't what I joined the Army, Navy, or Air Force to do. I'm suddenly being forced to go out in the field."

I was on REFORGER (return of forces to Germany), and we spent 30 days out in the field.[8] The women go on REFORGER just like the men do. I talked to a woman E-8 on REFORGER. It was her second time in the field. The first time had been 21 years earlier when she had begged to go so she could see what it was like, and she was allowed to go but couldn't stay overnight. She is now being expected to perform like a male E-8, and it is a taxing demand on her. One of the reasons that we have experienced higher losses of more senior women is they are now expected to do things they heretofore did not have to do, and are not trained to do.

Figure 17 shows retention by DoD occupation code. What it shows, I think, is terribly important. You can see that, in the traditional occupations for women, women have higher retention rates than men do, but in the traditionally male skills, women have lower retention rates than men. This leads to several arguments in the policy arena. The services are working hard trying to get women into nontraditional skills. They are working very hard to get men into these skills too, I might add. These skills (i.e., combat arms) often are the ones that aren't highly marketable on the outside. The Air Force, for instance, is turning down mental group I (women) in preference to mental group II (women) if the latter women want to be aircraft mechanics or accept another nontraditional skill.[9] Now there are many reasons to wonder if that is a good policy or not.

Figure 18 shows you the percentage of people in each of these same occupational groups that were female. Also, while there are a lot of women in the clerical positions, they only represent 13 percent of the people in clerical positions in the military. About 6 percent of the active duty force is female, so you can draw a line across Figure 18 at the 6 percent level and identify any skill area in which women are overrepresented, and those in which they are underrepresented.

Question: How does the 13 percent of clerks being women compare with the civilian sector?

Answer: About 70 percent of the clerical positions in society are filled by women, compared to 13 percent for DoD. Of course, a lot of DoD's positions are for company clerks in infantry battalions. We are not putting women in infantry battalions. A lot of the positions are for yeomen aboard ship. We are not putting any women aboard ship as yeomen, except on tenders, right now.

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[8]The annual REFORGER exercise involves realistic war games.

[9]Enlistees are classified into 5 mental groups, I through V, with I being the highest.

Question: What about the Navy's plan to have women aboard tenders?

Answer: The Office of the Secretary of Defense thought tenders were not a very good place to start. In the first place, we don't have very many women with the skills needed on tenders. Where are most of the skilled enlisted women in the Navy? What ratings? They are in yeoman, personnelman, storekeeper, air controller, electronic skills, communications, and intelligence ratings. Where are the concentrations of those skills at sea? What kind of ships? On carriers. Therefore, I argue that those are the ships where you should start. The Navy said, "but we can't do that, that's our combat arm." I submit to you, it is not closer to combat than where the Army is already.[10] In the Army, the whole battlefield is open to women. Women are expected to serve in their specialty (MOS), but they are not assigned to battalions or smaller units in the infantry, armor, corps of engineers, field artillery, or low altitude air-defense artillery. They are in all the transportation companies, helicopter repair companies, and tank repair companies. If you are going to lay cable, there is a good chance there will be a girl on one end of that cable, laying it up to the front. The Army has accepted the fact that there are going to be casualties among their women. The Chief of Staff of the Army sent a message saying, essentially, to forget the idea that you are going to take women out when you go to war. You can't fight if you take the women out. They have moved them into areas where they are now key NCOs. You can't do your job without your women.

Question: What is the minimum percentage of women there should be in a unit?

Answer: I don't think you should have less than 10 percent women in any unit. When you do, you get tokenism. In the Army, for instance, women should take their turn at guard duty. That tends not to happen when you have one or two percent women in the unit--you send a man out there instead. In REFORGER, some units had 20 percent women, and therefore couldn't tolerate women not standing guard duty.[11] Larger numbers make a big difference.

Question: Would passage of the ERA make much of a difference to the services?

Answer: I don't think ERA is going to make much difference. I think we are going to be there before ERA is there. On the 14th of February, 1978, the Secretary of Defense asked for all the laws to be repealed that discriminate against women in the military. He wants to put the Navy, Air Force, and Marine Corps under the same policies that are now implemented in the Army. Last year, Congress made a slight modification that allows the Navy to assign women to some tenders and for temporary duty to other ships.[12]

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[10]PL 10, USC 6015, prohibits the permanent assignment of women to combatant ships. There is no legal constraint on the utilization of Army women, but Army policy precludes their assignment to combat units.

[11]In the REFORGER conducted by the Army in Europe in 1977, research focusing on women's abilities occurred during a 10-day segment called CARBON EDGE. The results indicated that the performance of mixed-gender groups was no different from that of all-male groups. The performance of women as individuals was rated lower than that of men during the first 3 days, but equal to that of men on the last 3 days.

[12]The 95th Congress (2nd session) modified PL 10, USC 6015, to permit assignment of women to certain noncombatant ships on a permanent basis and to all ships as long as the ships were not expected to be in combat during such duty.

Question: Going back to the minimum percentage of women question--is there a maximum aboard ship?

Answer: I don't think you ought to have a ship that has less than 10 percent men on it. Tokenism would go the other way.[13]

Question: So you would be willing to go with a 90 percent female crew?

Answer: No, not with the current distribution of people in the force, and I think a token ship, a pink petticoat ship, is a bad idea. I don't think there would be anything wrong with 30 or 40 percent women in an organization, and I would see nothing wrong with 80 or 90 percent in some departments. Eighty or 90 percent of the air-controllers could be women. We now have some air stations where something like 80 or 90 percent of the air controllers are female.

Question: What influence would having women in combat positions have on real and potential opponents?

Answer: That is an important issue. In the case of the Soviets, I don't believe it would make much difference because they seem to think in terms of firepower. I believe having women in our combat units might make some difference to us, but we ought to think about it.

Question: Is there any group opposing the increased use of women in the military?

Answer: We just don't have anybody that I know of who is fighting increased use of women volunteers at an aggregate level. They fight use in certain skills; they fight putting them in certain places. There are, of course, commanders who don't want them in their units.

Figure 19 provides two ways of viewing how enlisted women are employed in the military services. The white bars show the percentage of the total number of enlisted women who work in various occupations; and the black bars, the percentage of enlisted positions in those occupations that are filled by women. Figure 19 shows, for instance, that 33 percent of the enlisted women work in clerical jobs, but that represents only 13 percent of the enlisted people in clerical areas.

Question: Is that good or bad?

Answer: I am not trying to prove to you that the number of enlisted women should be increased or decreased. I am just trying to lay out where we are, so you will understand what the issues are in DoD. I don't know if 33 percent in clerical skills is good or bad. Some people would argue that it's bad. I get pounded on from both sides. I get pounded on from those who say, "How can you possibly have a third of your women in traditional skills?" We say, "But that's where they want to work!" They seem to respond, "We don't care--it doesn't matter what they want, make them be good, and distribute them across the skills."

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[13]Navy policy for FY81 is to have a maximum of 50 percent women and a minimum of 30 percent. In February 1981, the percentage of women assigned to any one ship ranged from 10 to 25 percent, the average being approximately 15 percent.

You can see that women are overrepresented in medical and dental jobs. That is the only occupation on Figure 19 where the black bar is higher than the white. The black bar would go up enormously if we allowed it. Enlisted women want to go into the medical skills, and they are capable of going into medical skills. The biggest factor holding that growth back is the Army's concern that medics need to be able to carry wounded men for long distances, and that women couldn't carry the wounded. For that reason, they have closed down a lot of the medical skills in the Army. Most of the women truck drivers that I talked to in the Army enlisted to get into a medical skill, but they couldn't get in one, so they became a truck driver. That gives you one reason why they don't stay truck drivers. They didn't want to be in that skill in the first place, but they did want to get in the Army. They wanted to get away from home or something else, so they went into the skill that was open. We get male boiler technicians the same way in the Navy, so it's not an unusual phenomenon.

Figure 20 shows the distribution of personnel among occupations as a proportion of the total force, in addition to showing the percentage of men and women in each occupational area. Note, for instance, that Figure 20 again shows that 33 percent of the enlisted women are in clerical jobs. What this chart really shows is that the male percentage usually drives the total percentage. Thus, enlisted women don't have much effect on the total manning of the force--the force is still basically a male force.

Let's look at Figure 21, which provides the distribution of women officers across occupational groups. Here we find that 30 percent of the women officers are in medical jobs.

Figure 22 shows, for given years, what the officer and enlisted forces look like. The hatched bars represent skills that can be called traditional for women; and the unhatched bars, nontraditional skills. The projections for the officer and enlisted forces look about the same. The point that Figure 22 shows is that the growth in use of both officer and enlisted women has been predominately in nontraditional areas. If we decided to put a lot more women in traditional areas, the retention of women would be much higher than the retention of men. If we continue to drive more and more women into nontraditional occupations, we won't solve the personnel problems in those areas, because women just don't stay in those nontraditional occupations.[14] Now, these things can change and one of the best ways to get them to stay may be to recruit more women.

The women we get in the military are primarily nontraditionals in the first place. A traditionally minded young woman doesn't see the military as an opportunity today, but a traditionally minded young man does. It is, of course, more acceptable for a woman to go into the military today than it used to be, because there are more role models. I think the presence of role models is terribly important.

There are all kinds of problems with women in the military. There are problems with uniforms. The Army is just getting some of its uniform problems solved. They had combat boots for women that looked like male boots, but weren't the same quality. The heel sizes have got to be different. The bathroom problems were enormous emotional things. How will women go to the bathroom in the field? The fact is that that is just not a problem.

Question: Isn't there quite a lot of concern about fraternization?

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[14]See Wood, Pappas, Lovely, & Johnson. Migrations of Women to and from Nontraditional Military Occupations, 1979.

Answer: What does fraternization mean? Brotherhood? The brotherhood "problem" has existed since the early days of the Army. How many of you have been to a promotion party? Was there more than one grade or rank level represented at the party? Of course. I grew up in the military. The first promotion party I can remember was when my father made major. It was as if we had moved into a new society. He no longer associated with captains. In fact, he no longer called captains by their first name, nor did they call him by his first name. He now called majors by their first name, and the family was part of a new society. That was part of the class structure of the time. We've come a long way from that. Now you're still not supposed to go play ball with your troops. You're not even supposed to fix, say, airplanes with your troops. In various segments of the armed forces, there are different kinds of traditions and policies. One of the concerns of the Army is that they don't want company level officers being so friendly with their enlisted troops because that would influence the decision on who gets sent out on patrol, and that sort of thing. The Army seems to think that, if you date one of your people, there might be that kind of an impact on effectiveness.

In one of the divisions, a woman captain in a MP outfit married one of her corporals. I think there was a fear that he was going to apply for the Officers' Wives' Club. While that was a joke, it's symbolic of the problems. These customs and practices have been part of the military for a long time, and changes won't come easily. However, if you're too friendly with some of your troops in the group combat unit, you probably can't do your job right.

There are several other complications that should be mentioned. A lot of the women we are enlisting have more in common with the second lieutenants than they have with the other privates. Sociologically, women tend to date people a little bit older and more educated than they are. It is sort of a natural attraction. You can't solve that kind of problem by writing a regulation. The regulation will only become a joke.

The first time I heard of the fraternization issue was when I went to visit an Army division. For 3 days, I walked around the base and I didn't see anybody holding hands. I said, "Hey, I don't see any fraternization. Would you explain to me one more time what the problem is?" I was told, "Well, it isn't during working hours."

The fear is that there will be an erosion of good military order and discipline--an issue that is not insignificant. I think we will adapt, but I don't think writing rules is the answer. Why write a regulation if you can't enforce it? You are better off to work on the attitudes of the people. Don't say, "don't do this"--that just challenges me to do it! If you don't want the rules to be broken, write rules that make sense and don't have your seniors teach the new guys to break them.

Question: Are you saying that there is no rule for fraternization that makes sense?

Answer: No, I think you could write rules that make sense. I think public displays of affection aren't very conducive to getting the job done. Inattention to duty is something you have to worry about and you have to punish. If you want to work on social structures, and you don't like the fact that the second lieutenants are going to date the corporals, then you better work on the second lieutenants and have them understand and believe that it is going to make them poor platoon leaders. Perhaps we should call in some second lieutenants and tell them to write the regulation. When it is an older generation trying to impose social mores on a younger generation, it doesn't work. It didn't work with haircuts, and it didn't work with music. I think you weaken the discipline in your armed forces

when you make a big deal out of something you can't enforce, because then people say you can't enforce anything.

Question: Is the country ready to commit women to combat?

Answer: I think most policymakers would not advocate women being in, say, an infantry company. Of course, some women's groups indicate that women should be able to do anything that they want to do. I point out to them that the issue is not so much what women want to do, but what women will have to do. Our institution doesn't run on letting people do what they want to do. You are either in, or you are out. If we are going to have women go to sea on ships, then everybody is going to take their turn on the ships. It is not going to be such that the 3 percent of women who want to go to sea get to go to sea, and the 97 percent who don't want to go to sea don't have to go. That bothers the women's groups.

Decisions in this arena are very complex. They are decisions that involve the Congress, Congressional committees, the public, and so on. Congress had furious debates on opening Navy tenders to women. There was a great struggle to get that bill passed. A lot of people have been pounding on DoD to register men for the draft. There are going to be fights concerning registration of women.[15] To an extent, the Secretary of Defense has put Congress in a bind. He said, if we go to registration, we should register both sexes. There is a very good reason for that. We have a draft law on the books now for one purpose only, and that is to mobilize for the massive European war threat. If we have to do that, then we want to be able to mobilize rapidly. The current draft, the current Selective Service System, takes 110 days to deliver the first person. That is not adequate. We need something that takes about 30 days. We need something like 100,000 people in the first 60 days and the current system won't do that. If we had to draft, there is a pretty good chance that someone would get an injunction that says you can't draft just men. So, we had better be in a posture where we could draft both sexes.

Question: We have never drafted women, have we?

Answer: That is correct, we never have. The Joint Chiefs of Staff, in both World War II and Korea, asked for authority to draft women, but it was not approved. Women are a large source of personnel, and when you are starting to get squeezed, when you are starting to draft 45-year-old men, like we did in World War II, you kind of drool over 18- to 20-year-old women. That pool of untapped womenpower looks like a very attractive way to meet your force profiles.

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[15] As indicated in the introduction, this issue was taken to the Supreme Court. The court ruled that women do not need to register for the draft.

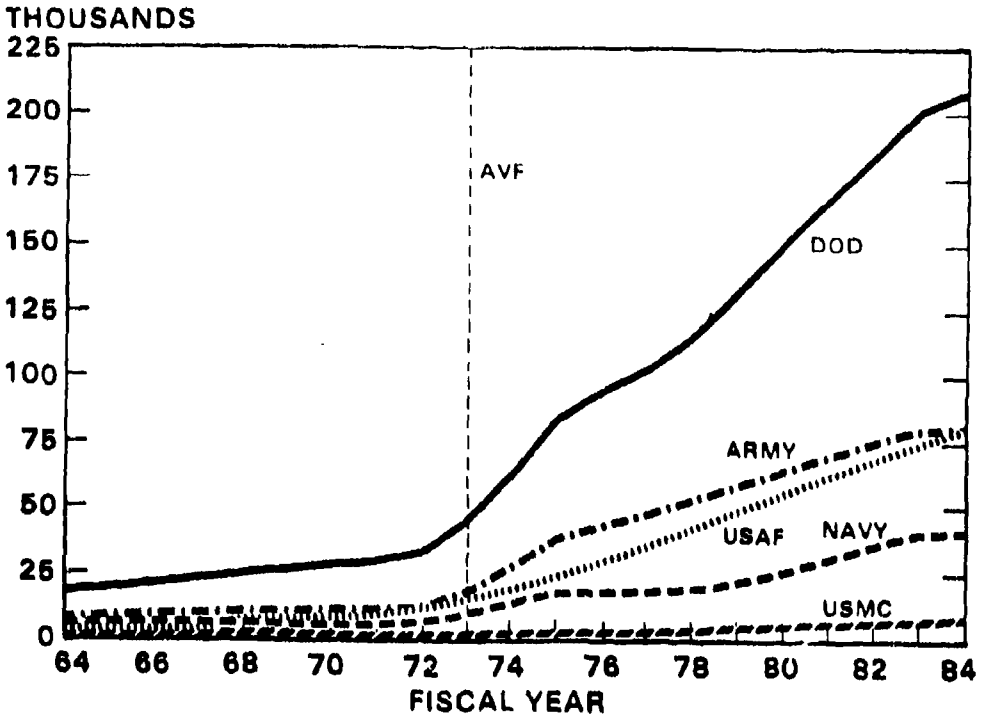


Figure 1. Active duty enlisted women end strengths.

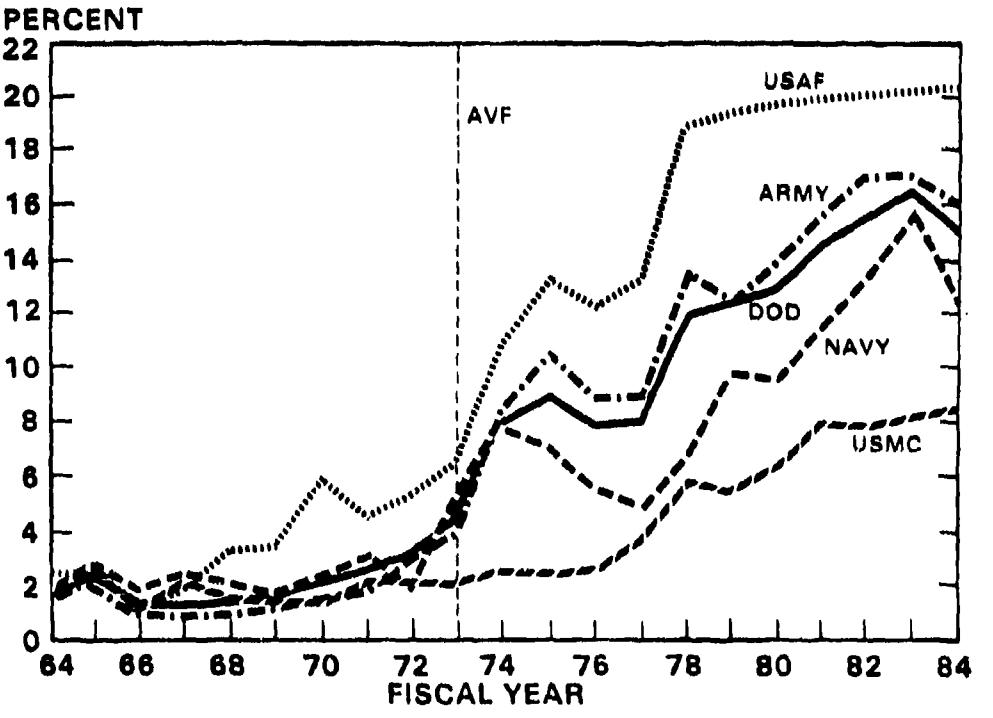


Figure 2. Women as a percentage of the total active duty enlisted nonprior service accessions.

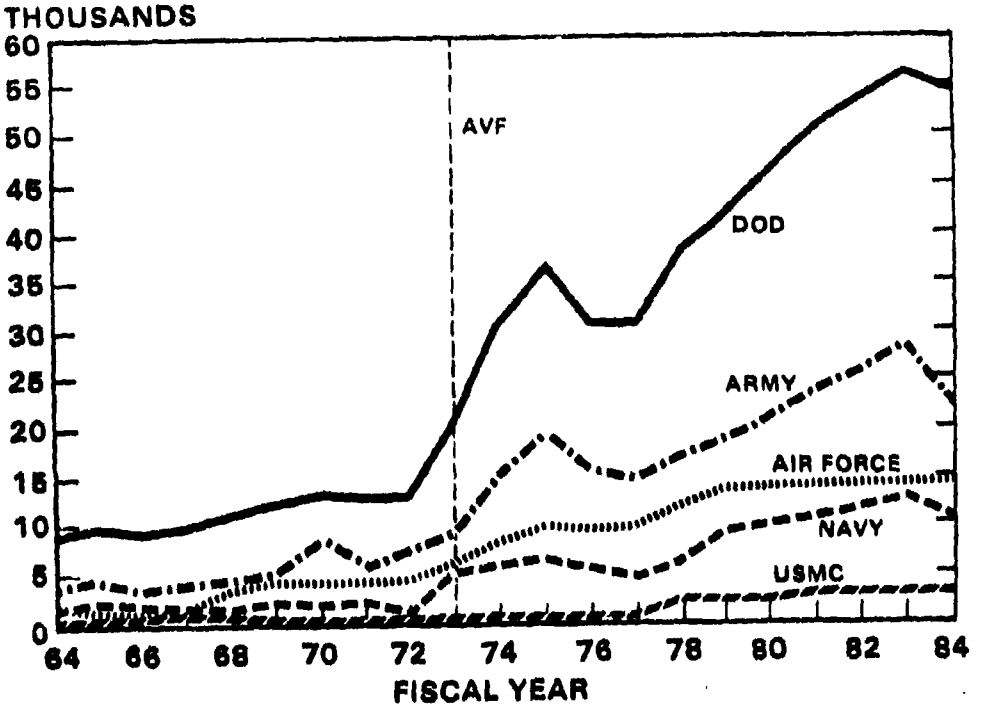


Figure 3. Enlisted active duty nonprior service female accessions.

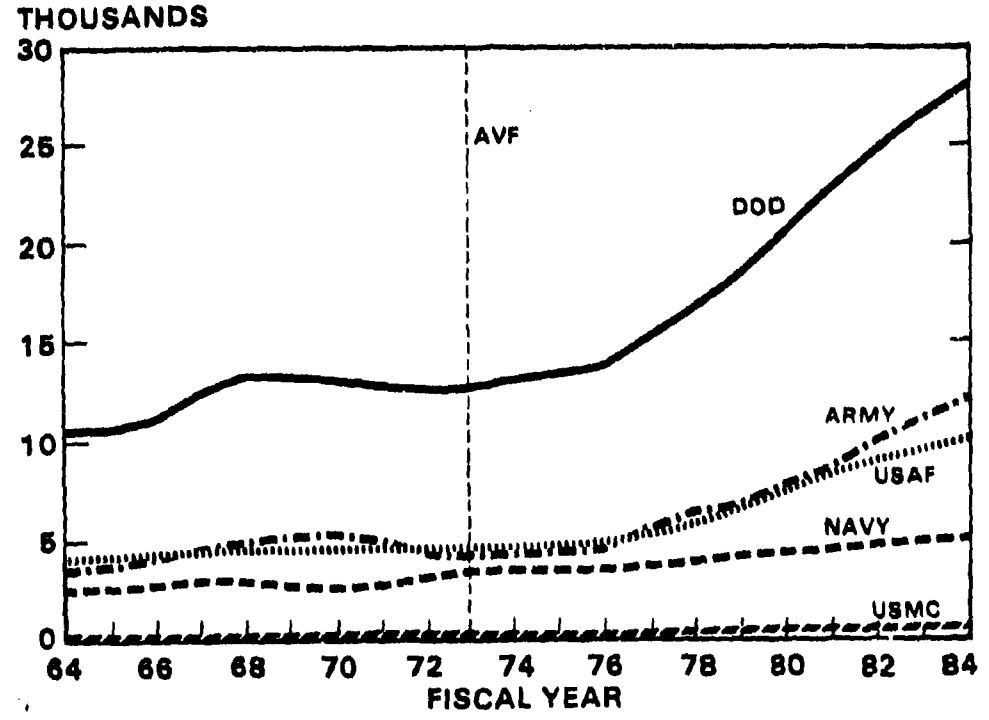


Figure 4. Active duty women officer end strengths (includes warrant officers).

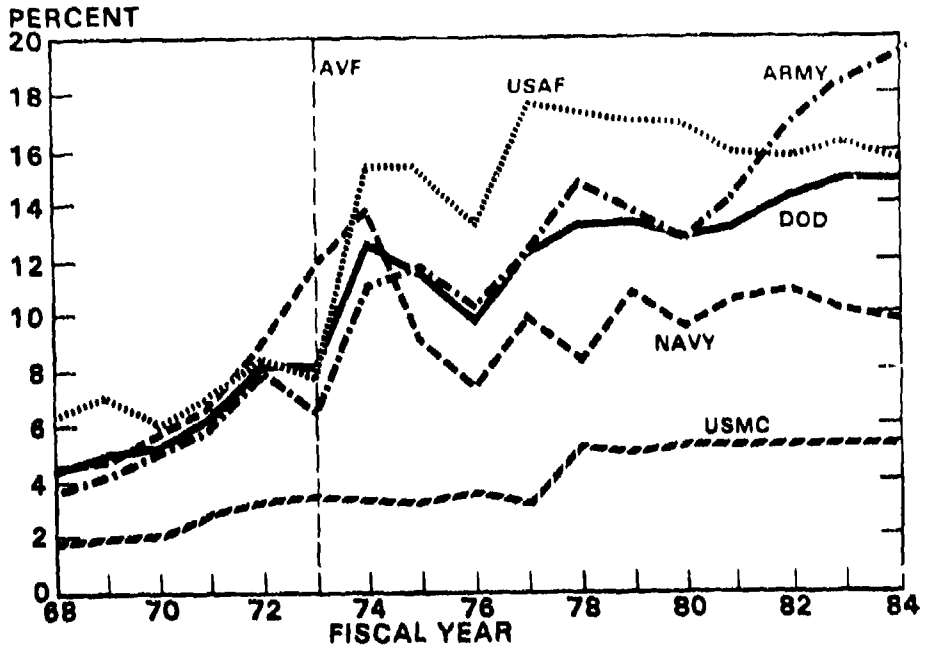


Figure 5. Women as a percentage of total active duty officer accessions (includes warrant officers).

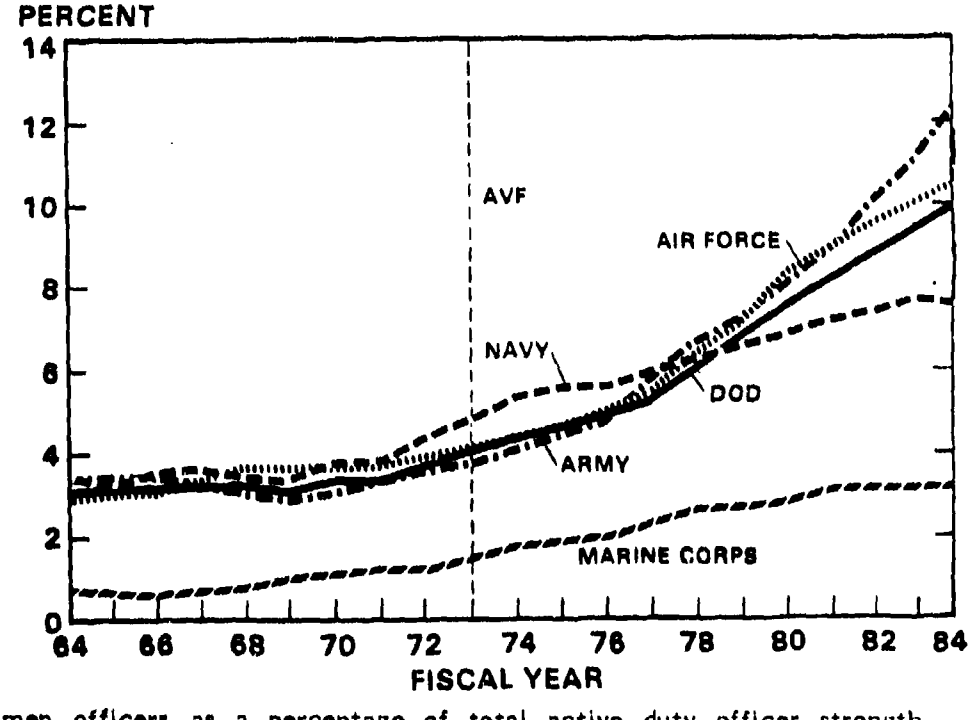


Figure 6. Women officers as a percentage of total active duty officer strength (includes warrant officers).

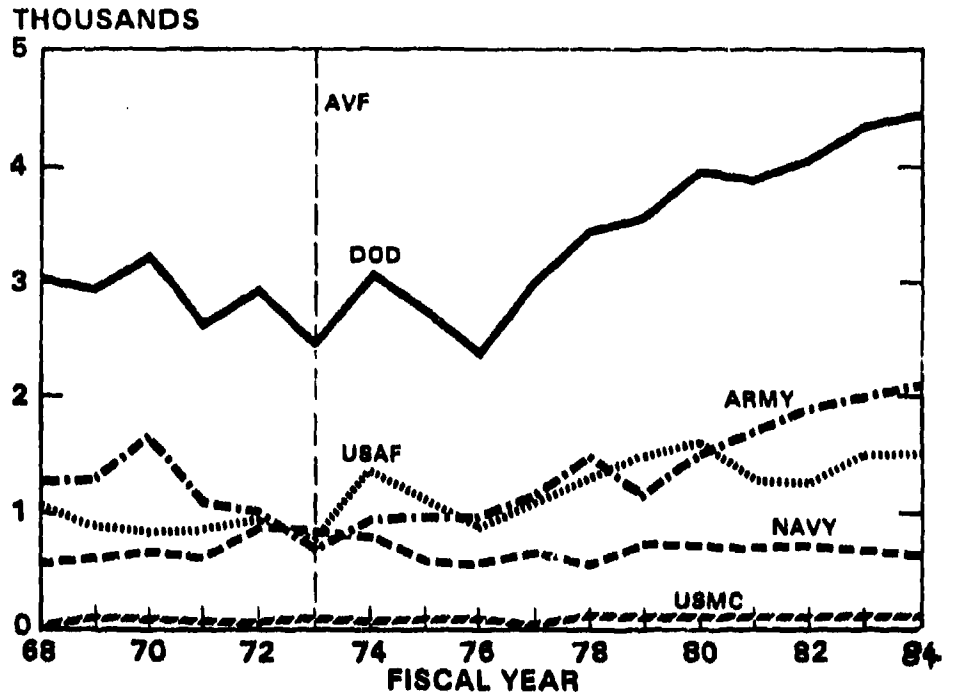


Figure 7. Active duty women officer accessions (includes warrant officers).

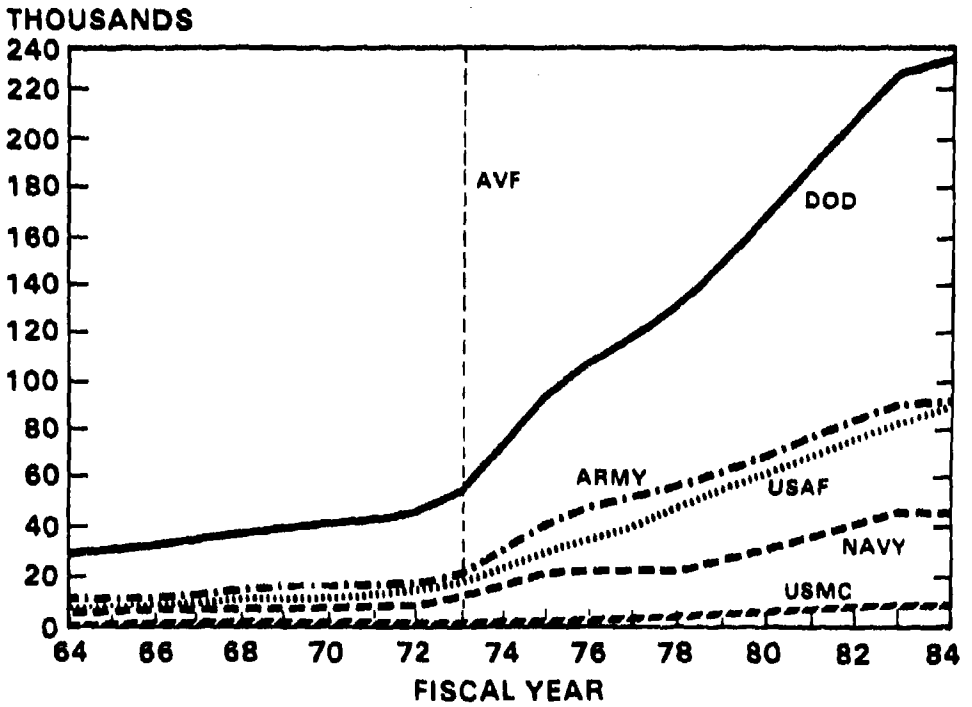


Figure 8. Total number of women on active duty (officer and enlisted).

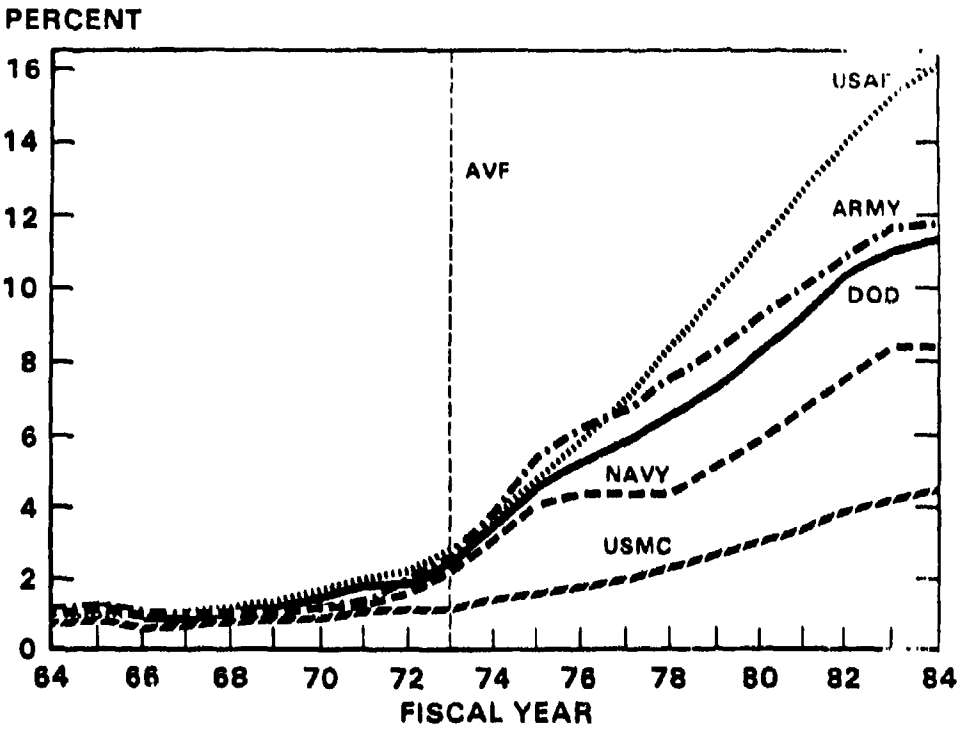


Figure 9. Women as a percentage of the total active force (officer and enlisted).

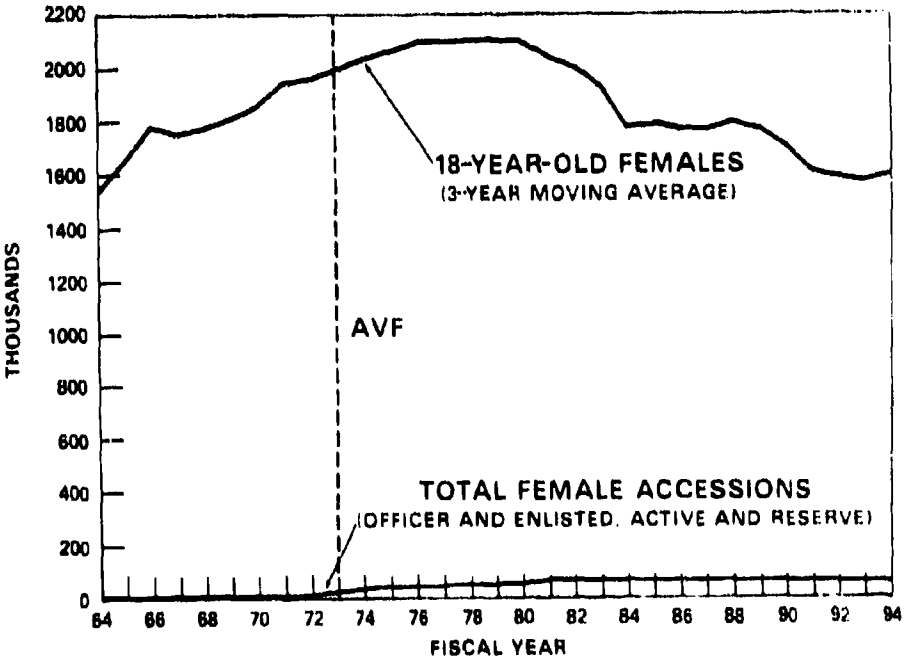
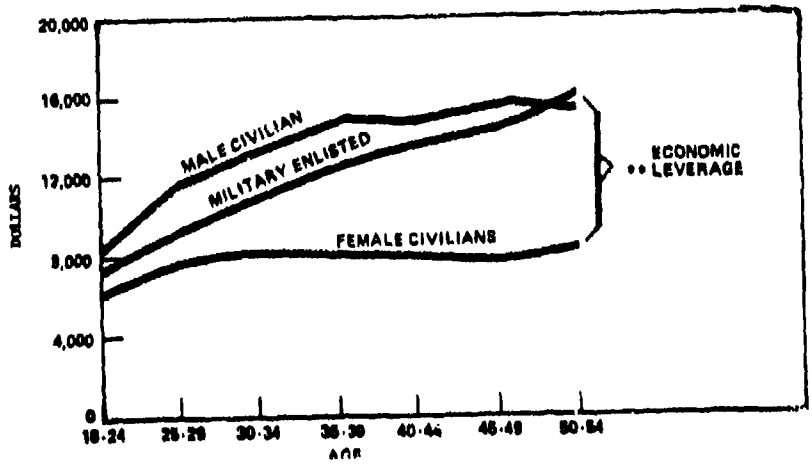


Figure 10. Supply and military recruiting of women.



Note: Comparison of mean annual earnings of civilian year-round, full-time wage and salary workers, with at least 4 years of high school but less than 4 years of college, by sex and age with military enlisted personnel by age for calendar year 1975.

Figure 11. Military-civilian earnings comparisons for women by age.

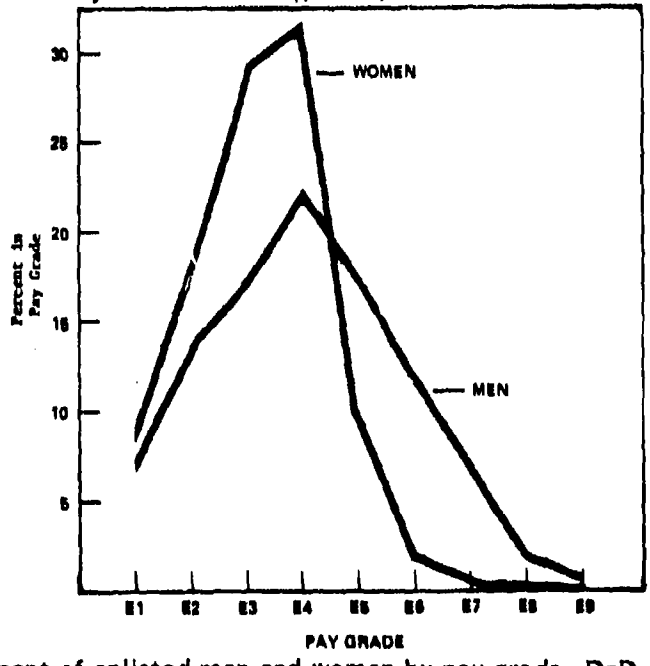


Figure 12. Percent of enlisted men and women by pay grade--DoD averages.

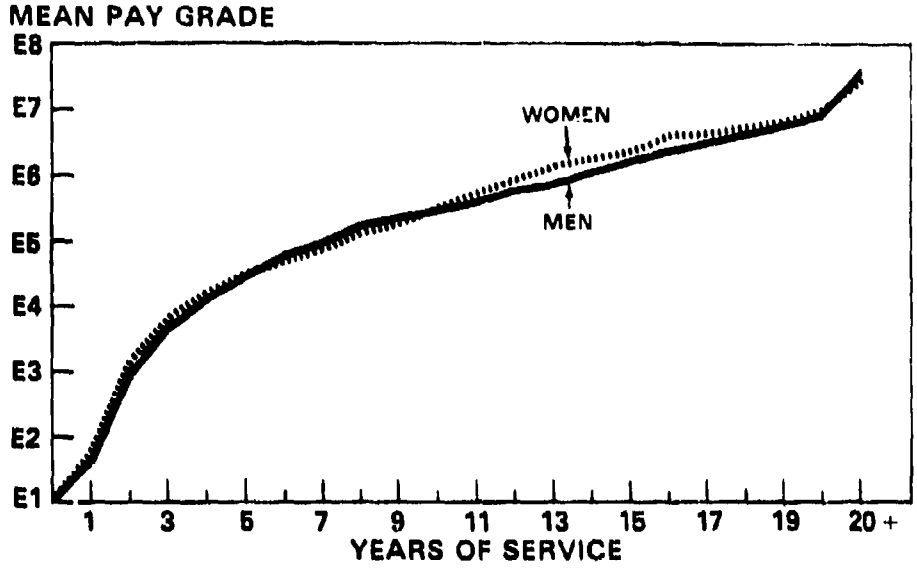


Figure 13. DoD average pay grade for enlisted men and women by year of service (as of end FY77).

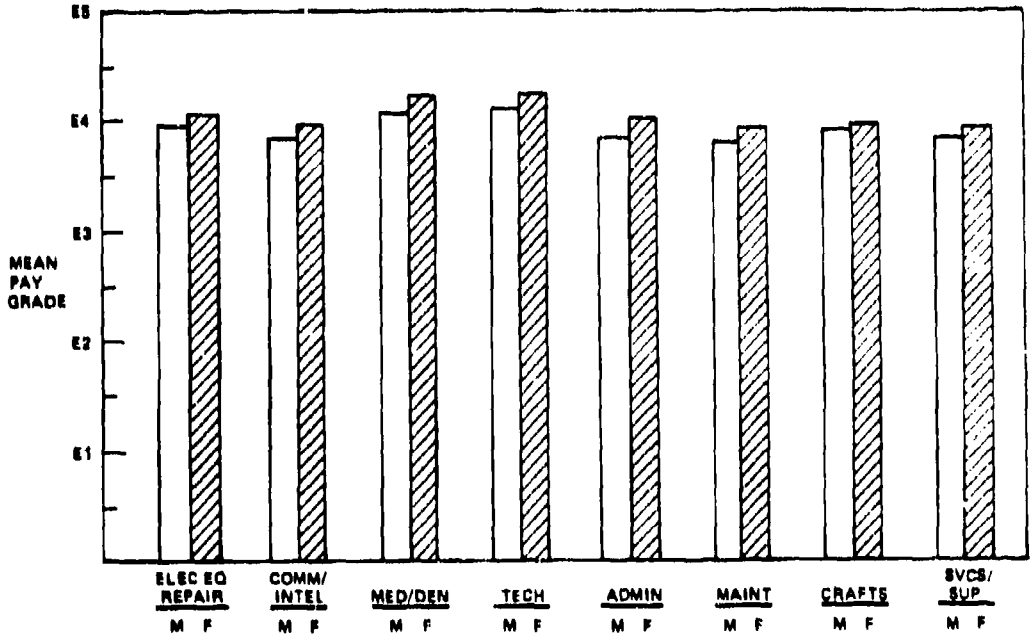


Figure 14. DoD average pay grade for enlisted men and women in third year by DoD occupational group.

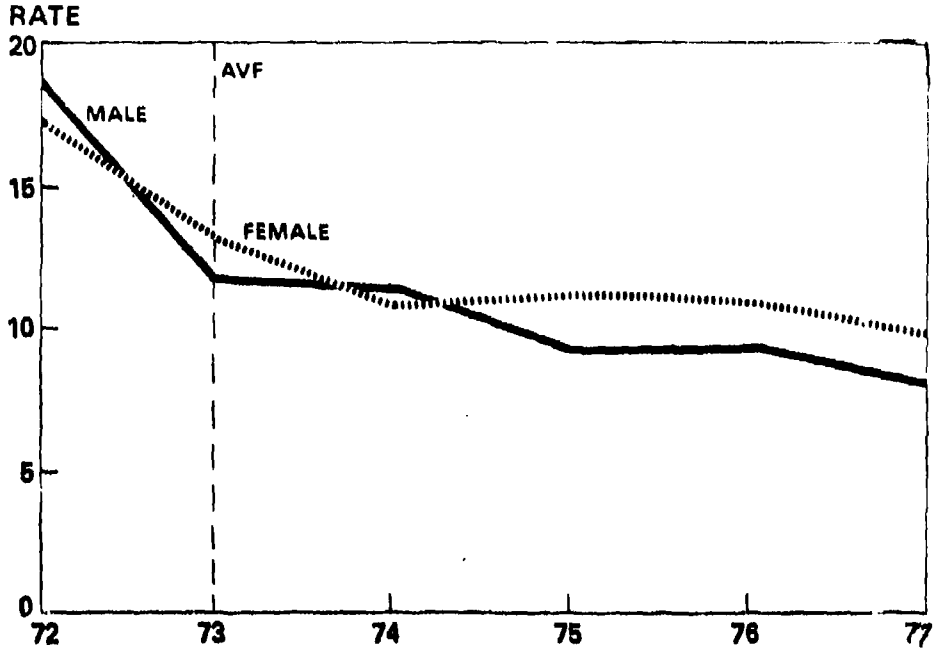


Figure 15. Active duty nonmedical loss rates for officers with less than 19 years of service (losses per 100 strength).

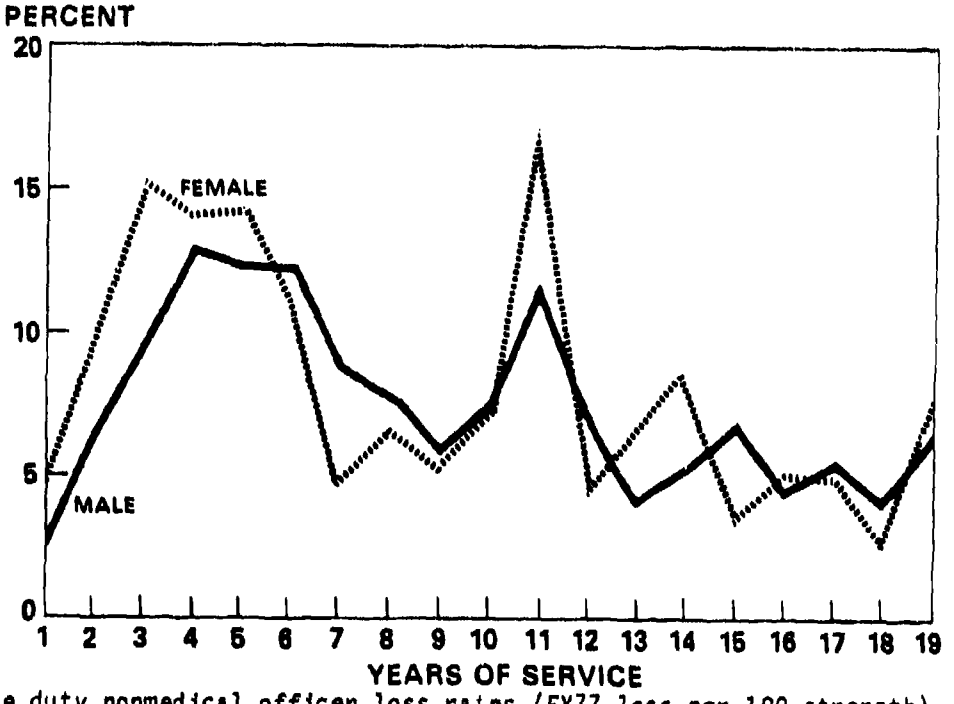


Figure 16. Active duty nonmedical officer loss rates (FY77 loss per 100 strength).

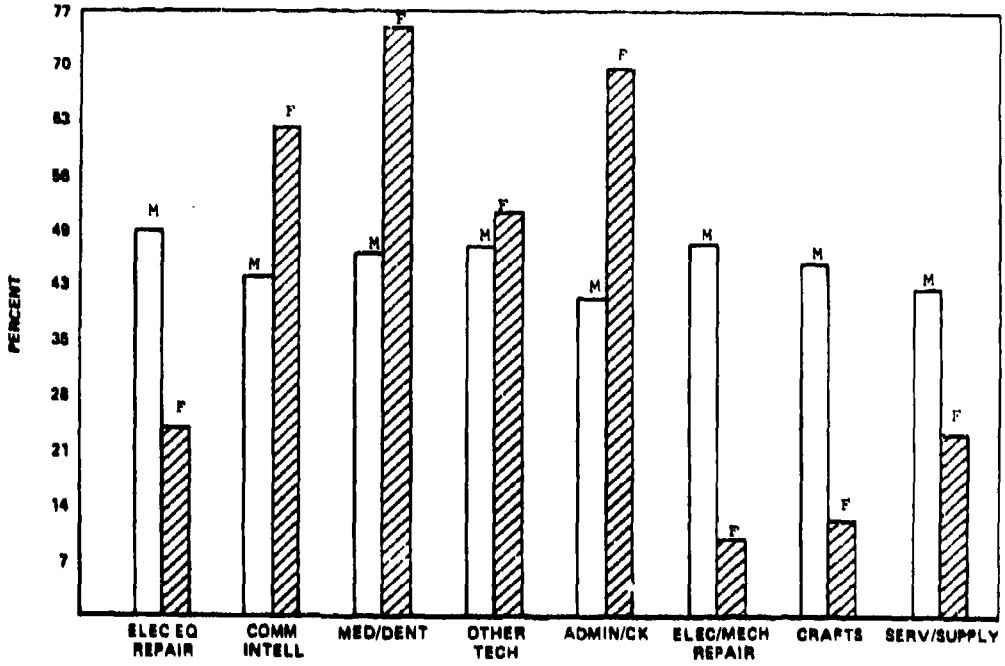


Figure 17. Retention of men and women by DoD occupation code. Shows percent of those entering skill in FY 73 who were still in skill at end of FY 76, DoD average.

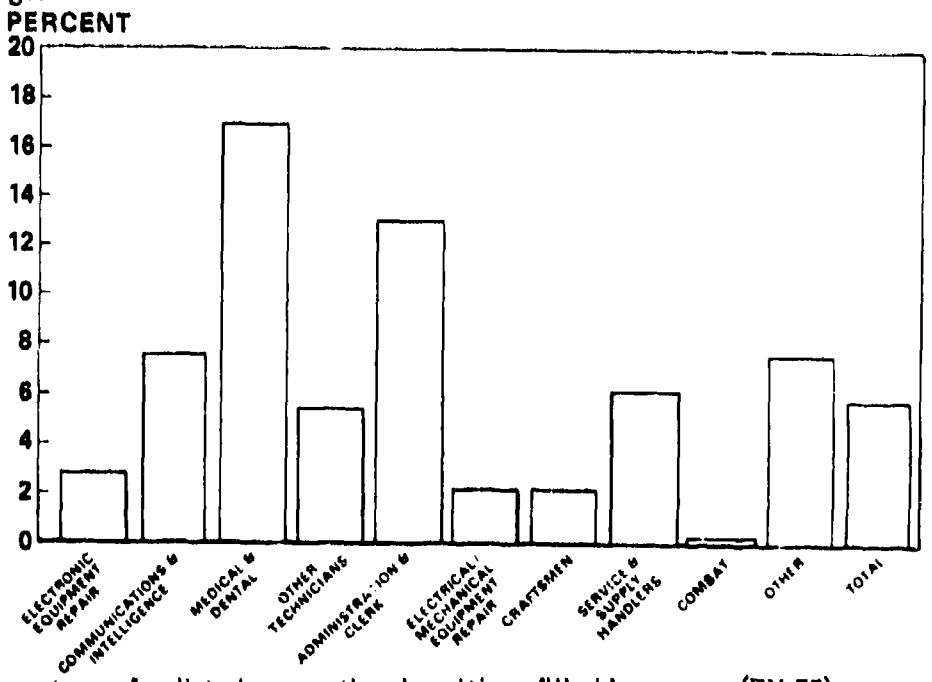


Figure 18. Percentage of enlisted occupational positions filled by women (FY 77).

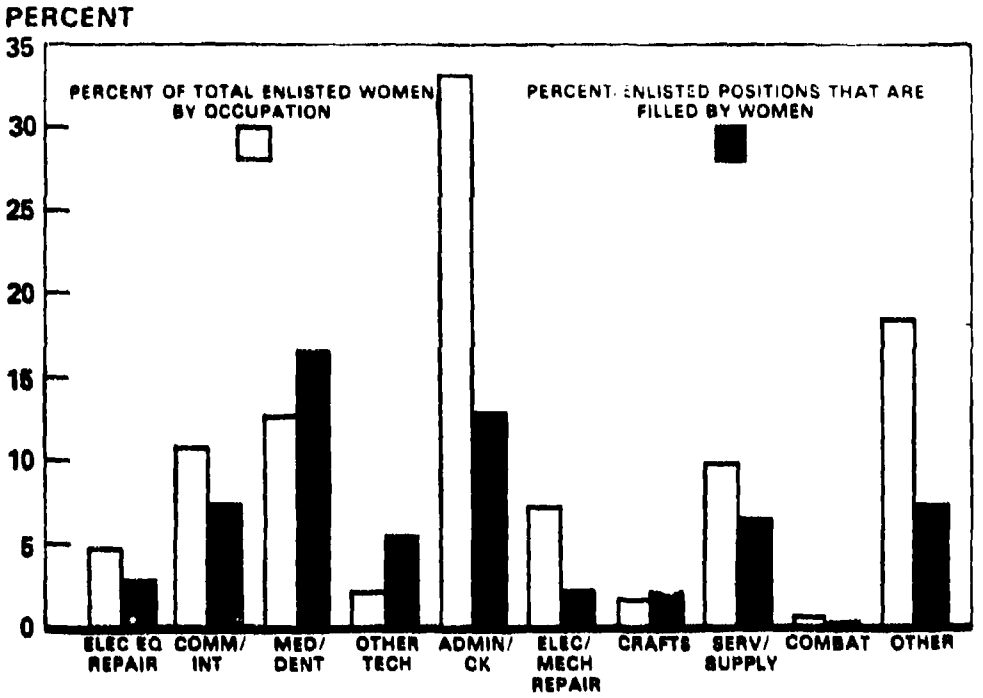


Figure 19. Distribution of enlisted women by DoD occupation group (as of end FY 77).

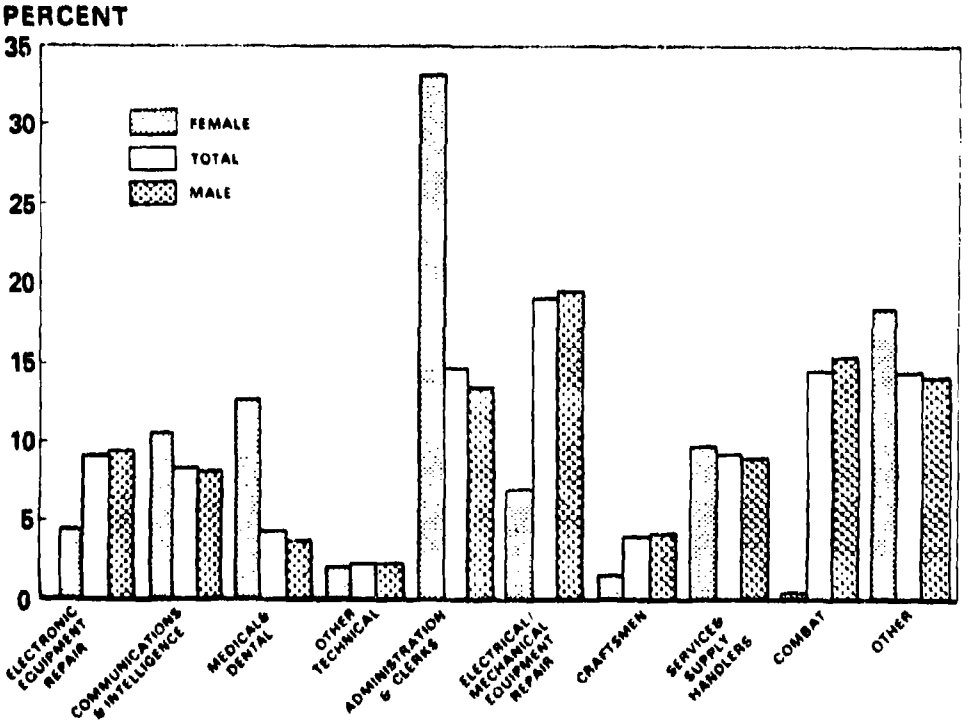


Figure 20. Occupational distribution of active duty enlisted personnel (FY77 percentage of total).

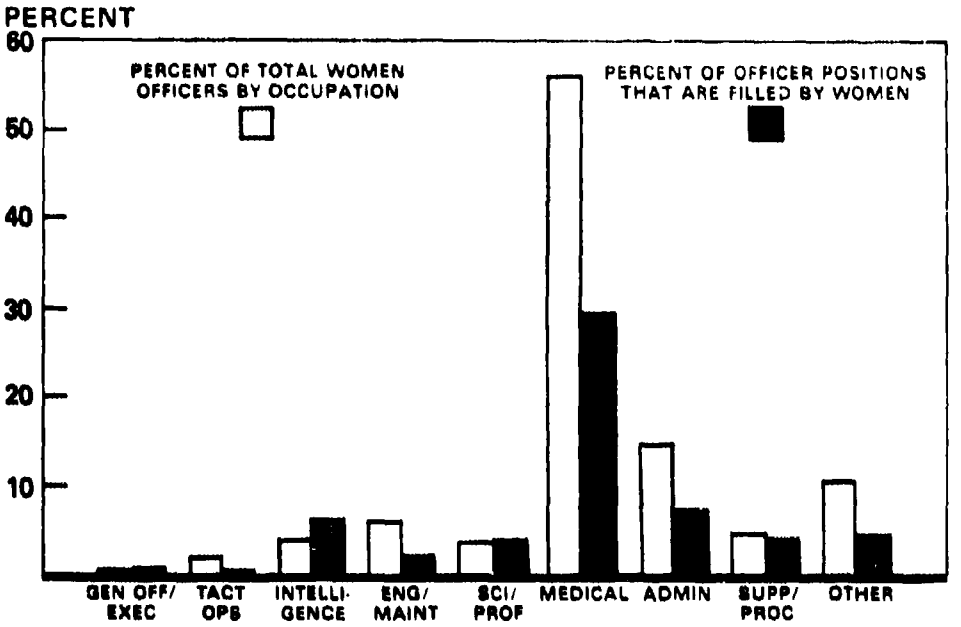


Figure 21. Distribution of women officers by DoD occupation group (as of end FY 77).

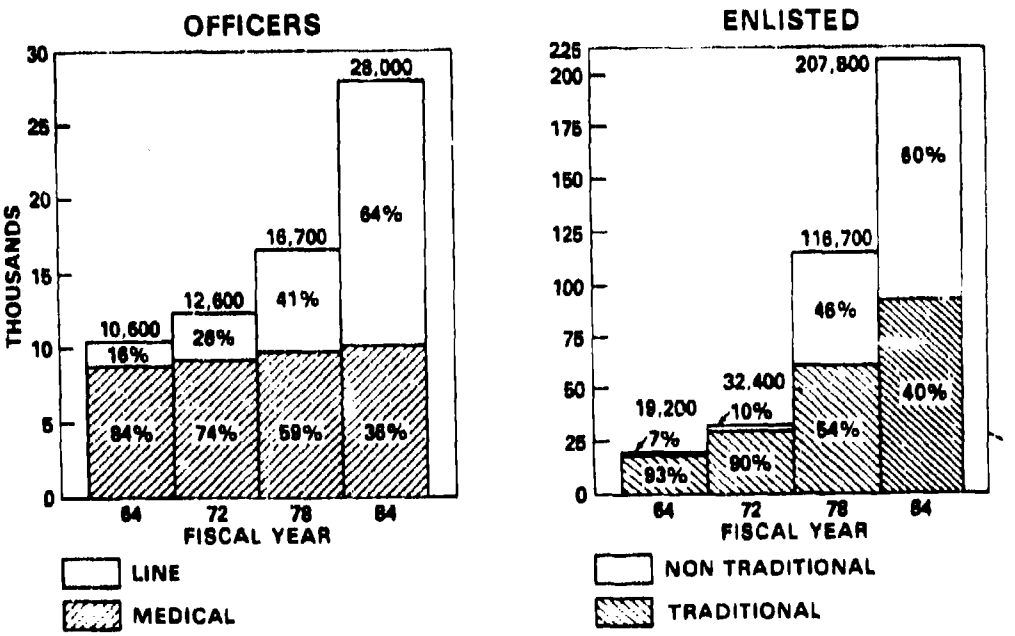


Figure 22. Active duty women.

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WOMEN IN MILITARY COMBAT: A HISTORICAL SURVEY

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Introduction

Lest anything I say or anything you may read in the growing literature on women in uniform should give you a contrary impression, let me make one point clear at the outset. Over the course of history, the participation of women in combat, either individually or within formations of women or mixed men and women, has been extremely rare. I am not sure how to quantify "extremely rare," so let me hazard a guess that, for all practical purposes and within an order of magnitude, it is less than one in 1,000,000. By this I mean that for every woman-day of combat in world history, there have been more than 1,000,000 man-days. I am not suggesting that this means the women should not participate in combat. I am merely reporting an historical fact in generalized quantitative terms.

Perhaps I should establish some parameters with a few definitions. First, when I use the term combat, or military combat, I do not include riots or unplanned fights between individuals or small groups of individuals. The violence employed in combat is that which will establish a lethal environment in which opposition to your accomplishment of the objective is overcome either by destroying the opponent or persuading him that continued resistance will result in destruction, which can be avoided only by surrender or retreat.

In other words, combat does not necessarily mean killing an enemy, but some killing and/or mayhem are likely and anticipated, and are an essential aspect of combat for psychological as well as physical reasons. For a participant in combat, two things are essential: (1) to be one of a group involved in organized action to inflict violence upon an enemy and (2) to be at risk, within range and as a target, in hostile lethal violence. Thus, I exclude women clerks and nurses in headquarters, hospitals, or other installations, who may be within range of hostile firepower but who are not engaged in organized action to inflict lethal violence upon the enemy. I do include--although just barely--women in antiaircraft units engaging hostile aircraft, but only during such time as an air-ground engagement is actually taking place. For instance, 100 women in an antiaircraft battery engaged for 30 minutes during an air raid would amass a total of 2.08 combat days for their engagement.

From these definitions, it will be seen that acts of terrorism or incidents of espionage, even though they may result in violence or death, will be excluded from my definition of combat. On the other hand, the operations of irregular forces or partisans in guerilla warfare certainly would be considered as combat.

An Historical Survey

Returning, then, to the incidence of female participation in combat, the historical record reveals that, for reasons that may be cultural, physical, biological, or otherwise explicable or inexplicable, women have rarely participated in organized combat. This was as true--perhaps even more true--in times of antiquity as it has been in intermediate or modern times.

Yet, literature and historical records tell us that women have always been capable of violence when impelled thereto or when the opportunity was offered. Not for nothing did Kipling write in his famous poem that, "the female of the species is more deadly than the male." In not a few barbarian tribes, it was customary that prisoners captured by males in combat would be turned over to the tender mercies of the ladies of the tribe for a slow death by torture. From this, it may be assumed that the women were at least as accustomed to violence as the men--but also note, that this was violence after, and quite distinct from, the organized violence of combat.

Be this as it may, there is nonetheless an identifiable, if not substantial, history of women involved in combat, which can be traced back to the dawn of history. There are three general kinds of female involvement in combat.

First, women have often served formally or informally in an auxiliary, supporting, noncombat role for the purpose of permitting men to be more effective in combat, but without actually participating in the fighting. This has been the traditional function of women related to combat, with caring for the wounded being the best known, if not the most important. The nurse's role was certainly the first to be formalized, beginning with the appearance of Florence Nightengale and other nurses in field hospitals in the Crimean War in the 1850s. It was also as nurses that women were first given permanent military professional positions, being commissioned as officer nurses in the U.S. Army and Navy nearly 80 years ago. Since early in World War II, women in uniform have been increasingly integrated into a variety of noncombat roles in the U.S. armed forces.

Second, women have indeed been participants in combat--but with a rarity to which I have already referred. In American history, Molly Pitcher is probably the best known of such female combat participants.

Finally, women have been leaders of military forces in war but not necessarily involved in actual battle. Among well-known historical examples are Zenobia, Boadicea, Isabella of Castile, and Joan of Arc. Joan, of course, was one of the few women who participated actively both in the leadership and the combat roles, and was apparently able to do so without in any way diminishing her femininity.

In this very brief survey of women in combat, I will focus on the second category: women who were combat participants.

It is not difficult to lift from historical literature the names of one hundred or more true women warriors, and to identify a handful of groups of women (few identified individually) who were also active war participants. But, at the risk of sounding like the male chauvinist that I possibly am, I must make a couple of points. And really, I am making these points not to diminish the importance of women in war, but merely to assure a true, objective, historical perspective of women in war.

With few exceptions, the women whose names have been recorded in the annals of combat made no extremely important contributions to the battles in which they participated, and they would probably not be known at all had they been men. The point is that we know the names of these women only because they were unusual among others of their sex in their time. Joan of Arc was one female warrior of historical importance. But name another!

Is this any reason why women should not be in combat today? Of course not! But it is an important part of the background of today's issues of the roles of women in uniform. Has the combat history of women been insignificant because women have traditionally been denied opportunities throughout history until today? In part, the answer must be yes, although it is questionable how much of an opportunity it is to be exposed to the dangers and terrors of combat. More realistically, of course, the lack of physical, legal, moral, or pyschological constraints to fight must account to some degree for the paucity of female combat experience. But is traditional role-playing the principal reason? I can't answer that definitively although, in my opinion, this paucity is due at least as much to biological and physical characteristics as it is to culturally imposed attitudes.

So, what about women in combat formations? There must have been some basis for the myth of the Amazons, but there is no solid history. Perhaps slightly more reliable is Sun Tze's story of the female combat unit he trained for the king of Wu, around 500 B.C., in the archaic era of the Warring States. I will not bother to repeat the semilegendary story, but it does suggest that 25 centuries ago one Chinese military man could train women to be soldiers, even though (like some modern men) he seemed to doubt that they should become warriors.

Subsequent to that, but still in antiquity, there are indications in Greek and Roman writing that in times of great peril women participated in the defense of besieged cities. Frontinus, for instance, in his treatises on stratagems in war cautioned that, "women serving in the defense of a city should not be allowed to throw stones or spears as the motion would reveal that they were women." This demonstrates not only that women sometimes fought in defense of cities, but also that their participation should be concealed from the enemy, presumably so that he would not realize how desperate were the straits of the defender. We know, of course, from the Roman accounts that women were pressed into service in the last defense of Carthage in 146 B.C.

Better documented are more modern accounts of the female regiments of Dahomey and of the female royal guard of the kings of Siam in the 19th century. Although the Siamese women saw little or no combat, the female soldiers of Dahomey seem to have been heavily involved in battle over a period of several decades. They are reported to have fought with exceptional distinction, skill, and bravery, but whether these reports were truly objective, or were inspired by the uniqueness of such female participation in war, cannot be determined for certain.

Even before the sudden importance of women in military roles in the past decade, most of us had heard of the famous all-women Russian unit of World War I--the Battalion of Death. Yes, we have heard of it, but we have not heard much. Obviously there was such a unit and obviously it was involved in some fighting. But how much? Apparently, precious little. But even if it had been involved in the average amount of fighting for a battalion, this would have been one of perhaps 2,000 in the Russian Army, and one of possibly 20,000 worldwide in that war. But since their combat involvement was extremely limited, the one to 1,000,000 ratio previously suggested is probably not far off. It was probably less than that in the Soviet Army of World War II.

Elsewhere in that war, there were two principal kinds of female involvement in combat operations. There were the female antiaircraft gunners of Great Britain and Germany, and there were the women partisans of occupied Europe. A wild guess--which errs on the high side--would say that there were perhaps as many as 30,000 woman combat

days in World War II. An equally rough guess is that there were more than 10 trillion man combat days in World War II.

Finally, there is the modern legend of the female soldiers of the Israeli army, fighting beside their men to help that tiny country, to some extent, offset the tremendous disparity between its scarce manpower and that of the surrounding Arab countries. I am sad to say that it is a legend with--like most legends--only a trace of fact behind it.

In Israel's War of Independence, 1947 to 1948, there were a number of instances of Arab attacks against Israeli settlements. In these settlements, there were, of course, women, and in many instances--even as in the days of ancient Greece and Rome--they were actively engaged beside the men in carrying ammunition, bringing food, repairing damage, and even--on occasion--manning weapons. Certainly they were engaged in combat, and they suffered casualties. And there were apparently a few women who were engaged in irregular warfare against the Arabs, although there was very little Israeli partisan activity during the war. In terms of combat days, perhaps the ratio was one to 500,000, twice as high, perhaps, as the guessed historical rate but still virtually negligible.

Since the War of Independence, there has been no instance of Israeli female involvement in combat that I can find. Israeli women have made up much less than 10 percent of the Israeli Army, have served only in traditional female roles, and, in comparison with the male-female relationship in the U.S. armed forces, are very much second-class citizens in the Israeli armed forces. Women clerks and nurses are immediately evacuated from the combat zone during times of mobilization or war. There was one woman fatality in the 1973 October War, and she was killed at Tasa, in Sinai, at the outset of the surprise Egyptian bombardment, before she could get to a shelter.

The overall Israeli female experience in combat, including the War of Independence, was probably less than the postulated one to 1,000,000 historical average.

All of this says that, in the past, under circumstances in which women have generally been denied equality with men, they have had a negligible role in combat. And, almost without exception, when there has been participation of women in combat, it has been a temporary expedient, usually limited in scope, in time of great crisis or peril. So far as I can tell, the concept of professional women warriors has been considered seriously only in 19th century Dahomey and 20th century America.

As I believe I have demonstrated, this does not mean that women have had no talent or aptitude for combat. However, it does show that, in male-dominated--and not necessarily chivalrous--societies, there has been no tendency on the part of hard-headed leaders to seek to develop or systematically exploit the specialized combat manpower potential of women, as opposed to using them fairly extensively to expand general noncombat manpower pools. Does this mean anything in an era and society that seems to be ending male dominance? I do not know.

Question: Does history provide occasions other than the ones you mentioned in which women are used in combat?

Answer: I do not think we can find many examples of women specifically trained for combat and then being used, other than the Russian and the Dahomey examples that I gave. We can find a legendary Chinese example of women being trained for combat but probably not used, in the State of Wu, or we can take a look at the female Siamese royal

guard in the 19th century, who were similarly trained but I do not think were ever used. Now then, to offset that, we have the substantial number of female partisans of World War II who were not trained but who were used.

Question: Is there any evidence in the literature that indicates how the opposition reacted when they became aware of the fact that they were fighting women?

Answer: The only thing that I can think of was the remark from Frontinus that you did not want to let people know that you had women actually manning weapons because that would indicate a state of desperation that you would not want to reveal to the enemy. I cannot think of any pieces of evidence in the literature, but it may well be that I simply am not familiar with them.

Question: From what you have said, it seems the Israelis became more conservative in their use of women in their armed forces. Why is that?

Answer: I've discussed this with the Israelis and I have heard the opinions that they were afraid that woman captives would be tortured by the Arabs . . . I want to be very careful . . . I might indicate a bias that I do not have. There was a feeling on the part of the Israelis that the Arabs are somewhat barbarous. There are different values . . . there is already a feeling of the Arabs that the Israelis represent a barbaric Western type of society that is not as cultured as their own society. So I want to make clear that I do not want to get into that debate. But, nonetheless, the Israelis were afraid of what would happen to their women when captured. Whether this was the reason or not, I cannot tell, but it is clear that women have been withdrawn from combat zones as soon as combat breaks out.

The second part of my presentation deals with the influence of behavioral factors on combat outcomes. I will start with two quotations that suggest that there are some behavioral influences on combat outcomes:

"The moral is to the physical as three is to one." (Napoleon)

"The presence of Napoleon on the battlefield was worth 40,000 men." (Blucher)

In Table 1, I have a number of statistics of well-known battles. Notice that, in these ten battles, five of the attackers, including three who were numerically inferior, and five of the defenders were successful. Three of the victors were numerically superior; and seven, numerically inferior. The point that I would like to make is that, in every one of those instances where a numerically inferior force was successful, there was a reason, and usually, but not necessarily, a behavioral reason, for the outcome. It could have been the rain, it could have been posture, or it could have been the leadership or morale. A term that the United States Army likes to use is "combat multipliers." A multiplier is one variable or another that caused the side that was numerically inferior to have its strength multiplied, in the fashion that Napoleon was thinking about when he was quoted about the relationship of the moral to the physical.

Table 2 shows the effects or factors I consider when I analyze a particular combat situation. It is possible to find ways to quantify variables such that one can obtain a reasonable approximation for all their factors/effects except for the 11 intangibles listed. Now, interestingly enough, and unfortunately for modelers, those 11 intangibles are probably worth about twice as much as the other 62 factors put together.

Table 1

Selected Battle Statistics, 1805-1944

Battle	Date	Attacker[a] (A)	Defender (D)	NA/ND	Victor	NV/NL
Austerlitz	1805	French	Allies	0.84	A	0.84
Waterloo	1815	Allies	French	1.79	A	1.79
Antietam	1862	Union	Confed .	1.77	D	0.56
Gettysburg	1863	Confed .	Union	0.85	D	1.18
Peronne	1918	Germans	Allies	2.40	A	2.40
Montdidier	1918	Germans	Allies	1.20	D	0.83
Ukraine	1941	Germans	Soviets	0.88	A	0.88
Kursk-Oboyan	1943	Germans	Soviets	0.69	A	0.69
Anzio	1944	Germans	Americans	2.05	D	0.49
Velletri	1944	Americans	Germans	1.19	D	0.84

Legend

NA = Number of attackers.
ND = Number of defenders.
NV = Number of victorious force.
NL = Number of losing force.

[a]Attacker shown was in attack posture in decisive phase of battle.

Table 2

Effects/Factors to be Considered in Combat Situations

Variables	Effects/Factors	No.
Environmental and operational	Weapons effects	22
	Terrain factors	6
	Weather factors	5
	Season factors	3
	Air superiority factors	4
	Posture factors	2
Operational only	Mobility effects	2
	Vulnerability factors	5
	Tactical air effects	6
	Other combat process effects	7
	Intangible factors[a]	11
Total		73

[a]Leadership, training, experience, morale, logistics, time, space, momentum, intelligence, initiative, and technology.

If we apply the variables listed in Table 2, particularly the intangibles, which can be lumped together as "relative combat effectiveness," to the ten battles listed in Table 1, we find that, in every case, the side with the superior combat power, depending on the circumstances of the battle, did in fact win. This is shown in Table 3. In other words, not only are there ways of representing the two quotations from or about Napolean, but, also, when these things are represented quantitatively, then--as Clausewitz tells us--superior numbers do, indeed, win battles.

Table 3

QJM Analyses of Selected Battles, 1805-1944

Battle	Date	NA/ND	WA/WD[a]	Basic Combat Power Ratio PA/PD[b]	Surprise Effects	Refined Ratio PA/PD[c]	Result[d]	Effective Combat Power Ratio PA/PD[e]	CEV[f]
Austerlitz	1805	0.84	0.87	0.94	1.73	1.63	13.46	3.69	2.26
Waterloo	1815	1.79	1.97	1.86	2.82	5.25	11.67	3.33	0.63
Antietam	1862	1.77	1.78	1.16	--	1.16	-2.02	0.71	0.61
Gettysburg	1863	0.85	0.85	0.55	--	0.55	-4.15	0 55	1.00
Peronne	1918	2.40	2.55	1.33	1.12	1.47	8.20	2.64	1.77
Montdidier	1918	1.20	0.95	0.60	--	0.60	-1.61	0.76	1.27
Ukraine	1941	0.88	1.18	0.82	1.33	1.09	11.90	3.38	3.10
Kursk-Oboyan	1943	0.69	0.79	0.49	--	0.49	1.60	1.32	2.68
Anzio	1944	2.03	1.31	0.49	--	0.49	-3.47	0.59	1.21
Velletri	1944	1.19	2.18	1.39	0.60	0.95	-1.48	0.77	0.81

Legend

WA = Weapons value of attacker.
WD = Weapons value of defender.
PA = Combat power of attacker.
PD = Combat power of defender.
CEV = Combat effectiveness value.

[a]Ratio of the total proving ground weapons values of attacker to those of defender.

[b]Combat power ratio of attacker to defender, considering all variable effects except behavioral and qualitative.

[c]Product of two previous columns.

[d]Quantified assessment of battle outcome. Positive value means attacker success; and negative value, defender success.

[e]Actual combat power ratio, based upon quantified battle outcome.

[f]Relative combat effectiveness of attacker with respect to defender. Value less than 1.0 means that defender had greater combat effectiveness due to superiority in leadership, training, or experience, or in some combination of intangible variables relating to combat effectiveness.

The importance of the intangibles has been demonstrated through analyses we have done using data from many combat operations--particularly data from World War II and from Israeli/Arab conflicts in the Middle East.[16] Through considerable analysis, we have found rather consistent differences among the performances of different countries'

[16]Reports documenting and explaining these analyses can be obtained by writing: Historical Evaluation and Research Organization, P.O. Box 157, Dunn Loring, VA 22027.

armies--even after the effects of differences in numbers of men and firepower and the other tangible factors have been considered. Factors such as leadership, eliteness, training, morale, and facility with technology apparently play a large role in determining the relative effectiveness of a country's military forces. My analyses suggest, for instance, that, on the average, 100 German soldiers were equivalent to about 126 American soldiers in World War II operations. Whether we like it or not, even when they were losing, their army was better than ours. They were better than we were when both sides had air power. They were better than we were when we had air superiority. They were better than we were when they were on the offensive, and they were better than we were when we were on the offensive. This is not only very embarassing, but also annoying. Why was this so? Is it because there is some inherent superiority of Germans to Americans? Was Hitler right? Are they a master race? Well, I do not think so.

I did my best to get the Pentagon to do the kind of study that I thought was necessary to find out what was important--to find out why the Germans were consistently better than we were in World War II. Then I wrote a book (1978) in which I concluded that the Germans are just as human, are subject to the same kind of fears, and just as likely to panic as are Israelis, Italians, Americans and so on. In my opinion, there is no inherent difference in the manpower quality in terms of intellect, strength, bravery, etc. This led me to consider such things as the General Staff. I came to the conclusion that the Germans had institutionalized military excellence, and the reason they institutionalized military excellence goes back to the years 1806 and 1807 when Napoleon defeated Prussia, one of the most one-sided victories in the history of warfare--an absolutely overwhelming French victory over the Prussians. There were some Prussians who said that they did not want to see this happen to their country ever again, and this led directly to the establishment of the Prussian (later German) Army General Staff.

I am convinced that it was because the Prussians established an institution (the General Staff), which was self-perpetuating and self-regenerating, that they were able to maintain their excellence in leadership, training, morale, technology, and so on, for a century and a half.

The history of the German military illustrates the importance of considering the behavioral and other intangible influences on combat effectiveness. U.S. military planners should keep the importance of the intangibles in mind as they make plans concerning the utilization of women in the armed forces.

INTEGRATION OF WOMEN ABOARD A U.S. COAST GUARD CUTTER

J. A. McDonough, Jr., CAPT, USCG
Commanding Officer
US Coast Guard Cutter MORGENTHAU

In May of 1977, Secretary of Transportation Brock Adams, in his commencement address to the Coast Guard Academy, announced that women in the Coast Guard would be going to sea. For a few months prior to that time, the new administration had asked questions of the Commandant on use of women such as, "What law is it that keeps you from sending women to sea?"[17]

There was no law! There never has been a law that prevented Coast Guard women from going to sea. There is a law that does prevent women from being assigned to combat in the Navy. Because of the Coast Guard's role in the law that specifies that the Coast Guard becomes a part of the Navy upon declaration of war or when the President so directs, the Coast Guard had applied the same constraints as the Navy on its assignment of women.

When Secretary Adams asked, "Why not assign women to sea?" The answer was, "Because we never have, sir!" As you know in this day and age, that argument doesn't hold much water. So, the Commandant agreed that, yes, probably women should go to sea. There was no law to prevent it. There was communication with the Chief of Naval Operations (CNO) and it was concluded that, because of the law, about the Coast Guard becoming part of the Navy during a declared war, women would not be assigned to ships under Navy operational control. Now the lawyers say that the law doesn't apply to that situation, but, to be ready to become a part of the Navy in a military readiness role, the decision was made that we would have men identified on shore that would come on board and take the place of the women. This was the initial concept. Since that time, that restriction has been removed. I have now been advised that there is no restriction on my going to refresher training, or operating with the Navy in a Navy exercise, under Navy operational control, with women on board. And, as a matter of fact, last December (1978), we did just that; we took part in a major Navy fleet exercise. Thus, the MORGENTHAU was the first combatant ship under Navy operational control with women on board.

I came into the picture on the 21st of July 1978, when I relieved the commanding officer of the ship. The women--2 officers and 10 enlisted women--came aboard in October 1977. Technically, the 2 officers jumped the gun a little bit, and came aboard before they were scheduled to, so that made them the first women to report aboard. About the same time, a sister ship stationed at Governor's Island, the GALLATIN, also took aboard 12 women--2 officers and 10 enlisted. The assignment of the same number of officers was just sort of coincidental. Two, however, seemed like a good minimum number. The number of the enlisted women was based on the fact that the ship accommodations are basically 10-man areas, with adjoining head space (there are larger 30-man quarters that nonrated personnel would normally use). No modification was made

[17]The following information will give the reader some current perspective on women in the Coast Guard. At the end of December 1980, there were 1196 enlisted women and 90 female officers on active duty; they comprised 4.5 percent of the active force. Of these numbers, 70 enlisted women and 15 officers were assigned duty afloat to a total of 15 cutters, one of which is commanded by a female officer.

to the ship. I had heard and read in the press that one of these compartments was converted for use by the women, so, when I came aboard, I went down and said, "What did you do? Let's look at the conversion." Well, the conversion turned out to be taking the men out, and putting the women in! There was absolutely no physical change made. I have a handout here--some of you have read or seen some of the articles. There is a philodendron growing in the urinal, if that's an alteration.

There now has been a total of 21 women assigned to the MORGENTHAU, and their rotation rate seems to be about the same as for men. I have some of the original women on board. By the time I arrived, a number of them had left to attend schools, training, etc.

Since I have been aboard, the ship has had normal patrols in Alaska. The Fishing and Conservation Act of 1976, which gives the U.S. jurisdiction out to 200 miles, requires permits of any foreign fishing vessel. The bulk of that fishing, if you want to talk in terms of ships, is done off the coast of Alaska. We just returned from Alaska 2 weeks ago. The ship has been very busy; essentially, we are underway 212 days of each year.

We are going to refresher training in 4 weeks, and we will be the first to take women into refresher training. We were a big hit in the naval exercise. For a long time, nobody knew we had women on board. I did not have to modify anything on the ship or any of the procedures. The one exception was using precaution on a voice radio circuit. Since you do not want to divulge the identity of your ship, I discovered I better not have any women's voices on any voice radio circuit. That really would blow my call sign, right away! As it turned out, I looked around and there were no women on the General Quarters billet for the three watches that would have been on a radio circuit, so there was no problem.

I have mentioned the ten enlisted women; there were four nonrated women and six rated petty officers--a yeoman, a corpsman, a storekeeper, two radiomen, and, I believe, a quartermaster. The mix of six petty officers and four nonrated women has stayed that way, primarily because petty officers are assigned from the central office, in Washington, while the nonrated people are assigned from the district, in San Francisco. There are no set rates for women. The one exception decided by Headquarters, at least on the first two ships, is that there would be a woman corpsman on board the ship. The ship carries only one corpsman and, normally, "he" is a chief corpsman. However, the initial woman corpsman was removed from sea duty due to a back injury caused by mountain climbing in Alaska. She was taken off the ship and reassigned and her relief did not come aboard right away, so I made half of a patrol in the Bering Sea and the Gulf of Alaska without a woman corpsman, and I had no problems. I do not have any engineering women, but the GALLATIN has had women in engineering. I think, for some reason, the Coast Guard is having a problem interesting women (and men) in the engineering rates.[18]

Admiral Hayes just took over as Commandant in the summer of 1978. One of the first things he did was remove all restrictions based on gender, on all assignments. I thought that this message would be greeted by screams of glee from the women on board. Instead, most of their attitudes were, "Well, it's a little late getting here." Just as if they expected it--it was no surprise. Along that line, a year after the first women came on board, we were again underway up in Alaska, and somebody mentioned, "Hey, wasn't this the day (a year ago) the women came on board?" And somebody else said, "Guess it

[18]Subsequently, one woman electrician has been assigned and well received.

is, no big deal." We held a big celebration when we are halfway through the patrol and are on the way downhill, but no one felt a celebration was appropriate for that occasion.

Initially, all the women assigned to sea duty were volunteers. When they opened sea duty up to women, the lawyers said, "When the women enlisted in the Coast Guard, they were not legally permitted to go to sea. There was an implied understanding that women would not be assigned to sea or to isolated duty at one of our LORAN stations, so you shouldn't assign them." The Commandant felt morally that he should not assign them, unless they were volunteers. But, as of May 1977, everybody who has been enlisted or reenlisted has had it made clear to them that they would be subject to assignment to sea duty or isolated duty. So they are no longer volunteers. I think that all of my women officers have been volunteers. Many of the female seamen coming aboard, more recently, have not been.

There are four basic departments in the ship's organization. The largest department is Weapons, which has the deck force, ASW, and gunnery divisions. The weapons officer is a woman. Since these women officers came from Coast Guard units where they already had a year's service, they were senior to the ship's male ensigns. However, they knew less than the ensigns did about the ship, and that bothered them. That has turned around completely now. The new ensigns coming aboard are assigned under women who have been aboard for some time. More than half the people are reporting to their first Coast Guard unit. They are coming out of boot camp and schools, and then they are coming aboard their first operational unit. Everyplace they have been, they have been around both boys and girls and men and women. I think, frankly, that it would be more of a strange experience for young men to come aboard a unit that was all male, because they would have to make a transition from a mixed society to an all-male ship. They do not have to do that on the MORGENTHAU. It's there! It is what they are used to. Currrently, the problem you have is the chief, or the first class, or somebody like me who has served aboard ship before, who comes aboard and finds that things are different now. I know there is something different, and I would like to think that, by the time my tour is over, I won't recognize the difference.

I think, however, the CO should recognize the difference. As I have often said, "I have a mixed gender crew, not a unisex crew." There is a difference. And you do respect an individual's right to privacy. But I think that it is interesting that the new people coming on board accept the situation very readily. It is the older folks that stop when they first hear women piping something on the ship.

There is one minor problem with awakening the watch reliefs. Normally, the boatswain's mate of the watch or the messenger goes around and wakes the relief. We do not permit men in the women's berthing compartment. Alarm clocks are the answer, but the only problem with an alarm clock, when your bunks are stacked two high and they are 3 feet away from the next one, is that it awakens everybody. We haven't really come up with a good solution.

Another problem that arose came about because, normally, you assign the junior people that have just come on board to mess cook duty--that is the first job assigned aboard ship. You are in the scullery or the galley as a mess cook. So when four nonrated women walked aboard the GALLATIN, it was very natural (since it was the ship's routine procedure) to assign them all to mess cook duty. Then GALLATIN took off to go to the North Atlantic on fishing patrol in October, which is kind of cold. Two things happened. The women felt, "Here we are back in the kitchen. These guys think a woman's place is in the kitchen." They weren't very happy. The guys, out on lookout and working on deck in the cold, were saying, "The women are getting the cushy jobs back in the galley, inside

where it's warm." Nobody ever said that about mess cooking before, but, all of a sudden, that's the way they looked at it. As soon as the problem was pointed out to the commanding officer, he said, "Did we do that?" There are men who would do that, but this situation just happened. After that, the women were hurried through mess cooking duty. They didn't want all the women in the galley at once.

We did change a few rules. There were some unofficial rules such as staying off somebody else's recreation deck, and no males were permitted in the women's berthing area. We did not rewrite the ship's regulations and say "he" and "she," where we had only said "he." But I try to be careful about writing. We have a ship's newsletter that used to be addressed to "Dear Families and Wives of the MORGENTHAU" or something like that--and I wrestled with alternatives because we do have some women who are now married. I just came up with "Dear Friends of the MORGENTHAU," and let it go at that.

We have had to do some different things or get new equipment. We had an immediate problem with the boarding teams that go out and board foreign fishing vessels. The teams wear wet suits (actually they come in three sizes--large, very large, and way too large). But the top that would fit a woman properly didn't match the bottom. They make them for women, but we didn't have any. Also, we did increase medical supplies and related items.

There have been some romances aboard. There was an engagement announced on our last patrol, and everybody thought it was a great idea. Just happened to be a Navy petty officer that had asked to be assigned to the ship for an Alaskan patrol. (I don't know if he asked to come on the ship because he wanted to see Alaska, or because he had his eye on my third class quartermaster). As far as hand holding, somebody asked, "Why didn't you permit them to hold hands?" Well, where do you stop? They sort of agreed on their own that there would be no displays of affection. That doesn't mean they were not sitting next to each other watching a movie on the mess deck and holding hands.

I haven't had one problem that was forecast; that is, that there would be fights over the girls. I was asked whether or not there have been any marriages of MORGENTHAU crewmembers. We have had a case where two people aboard the ship got married. Since the man already had orders to leave, they got married and kept it a secret until he left. We have had married women come aboard. I have a female seaman who is married to a civilian. I have had a boatswain's mate get married after she came aboard to somebody who was at her last duty station and is now stationed on another ship. An interesting thing happened there: The Commandant's policy is that married couples will not both be stationed aboard floating units against their will. In other words, one would be ashore to get government quarters, and, if they have children, to take care of the children, the dog, the cat, etc. It is a good policy. Since they were both aboard ship when they got married, that situation existed for a while. She is still aboard, so I guess he has been stationed on shore.

I haven't been in touch with the Navy ships, such as GOMPERS, that are being integrated. However, I did have a visit from a team from Naval Human Resources Management Center, San Diego, when they were preparing their plan for women to go aboard GOMPERS. I had been in touch with the other Coast Guard ship with women, GALLATIN. Initially, we were asked to submit a quarterly report to Headquarters on how things were going, what problems we saw, what recommendations we had, and so forth. The two ships (GALLATIN and MORGENTHAU) were exchanging copies of these reports. The other ship was writing the report almost as if it were a fitness report on each individual. The commanding officer became very concerned because these reports were fascinating for anybody who was interested in what was happening. They were becoming a

very popular thing to copy, and thus copies were floating around Headquarters. He didn't want to put FOR OFFICIAL USE ONLY on them, so he asked that copies not be made and circulated. MORGENTHAU's approach to the report was a little bit different. The individuals were not identified. Instead, the report said that a petty officer did this or a nonrated person did that, etc.

I was at Headquarters when I got orders to this ship. As a matter of fact, if there is any question about it, I asked for this particular ship. Although I make a conscientious effort at social gatherings not to mention women aboard ship, every time I end up talking about women. People will ask about it--it is still a novelty. The greatest thing will be to get women aboard all the ships, so that the MORGENTHAU isn't unique. The Coast Guard just doesn't have enough women to go around. We kind of enjoy it, but we do get over-exposed to the news media. For example, we had CBS calling by phone-patch to the Bering Sea from New York wanting to talk to my weapons officer, because she had been issued orders to be CO of a Coast Guard cutter stationed at Maui, Hawaii. She will be one of the first women skippers of a ship. The women resent the publicity. The men very much resent the publicity. We stopped at Ketchikan, and the paper had a three-page spread on the ship. It's a good article. I like this particular headline, it says "Not the Loveboat, Just a Coast Guard Crew Doing Their Coast Guard Mission." I was glad that was the impression that the reporters took off the ship.

I did do some data collection before going to the MORGENTHAU. I did talk to the CO of the GALLATIN at some length. I also, of course, talked to my predecessor during the week that we overlapped in the change of command. Because of my prior job, as Executive Assistant to the Commandant, I was very familiar with the program, and firmly believed that it was the way to go. I've been preaching that we might as well get with it. I would much rather do it at my pace, aboard the ship I want, with the number of people I want, than to have some federal judge telling me how many people to put where.

I have talked to the CO and the XO of MELLON, in Honolulu, which is getting women now. They have been aboard for the last week or two.[19] I have had calls from Headquarters, and have been interviewed by the people concerned about the expansion of the program, asking, "What do the people need?" My answer to them was that, if they got an opportunity, they ought to go back and read the file of these reports we have been sending for a year and a half now. I think that would be useful. The philosophy of how to do it is, basically, that it should be kept low key and not made into a big thing. My people felt that if the people coming on board were rated and were qualified in their rate, they would have no problem. But they said things like, "We'll give them the benefit of the doubt." Right away, there is a mind set there. We must truly make them equal. There are new things you have to get used to. Senior people keep coming aboard and saying, "You know I'll keep an open mind," but pretty soon they realize there really isn't a problem. It doesn't mean the whole thing couldn't blow up tomorrow. I don't think that is going to happen, but there could be a problem. It was interesting that the Navy's approach was, "What indoctrination can we give the women?" They were planning a shoreside assembly for women to bring them up to speed. I am not sure what they really planned to do. I advised that they better focus on the men so that they would welcome the women on board, rather than resent their coming. New people coming to the ship show up one, two, or three at a time and they fit in pretty well.

I will be getting a new XO this time, and I want to have a good talk with him, but I really want him to talk to the current XO, because if anybody is the architect of the

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[19]The reader should recall that this presentation was given in early 1979.

program, he is. A questioner has asked me to discuss further the women coming aboard who were given jobs because of their seniority. These women came aboard almost ready to make JG. When they first admitted women to the academy (first class graduates in '80), a decision was made that women would go through the same curriculum as men. Women would have the same summer cruises on the EAGLE and other cutters as the men. As far as I know, the training at boot camp is all the same, and this is one of the issues I wondered about when the Navy said they have to give the women an indoctrination on what it's like to be aboard ship. If they are thinking about the brand new "boots," I don't really think that would be uniquely necessary, because they are just as competent to go aboard ship as are the men. However, if you are talking about second or first-class petty officers, of whom more is expected, they could go aboard and not be familiar with some of the terminology and equipment that is used aboard ship. You would expect a second-class petty officer to be familiar with watches and stations aboard ships.

Somebody asked what else we had done. There is a pipe we don't use on the MORGENTHAU, and I think this indicates some of the positive side of this whole thing. Anybody who has been aboard ship knows that, on a weekend, you will hear the pipe, "For the information of all hands--there are women guests on board." It is not needed on the MORGENTHAU. Why did we pipe that? I think we piped it so the guys could clean up their act, would watch their language, won't walk out on the mess deck in their skivvies, or whatever. Not necessary. We just don't do it, but that doesn't mean that someone doesn't swear once in awhile. Now it's a little different--it really is. On my first inspection, I noted different items in the ship's stores. Now there is no problem at all, but that first time, everything hit me. Hey, this is new and different, it's different! I am slowly getting away from reaction; it is "less" different any more. However, I don't think I will ever say that it will be unisex. I think it is kind of neat, frankly, to have a woman on the radio to another Coast Guard cutter up in Alaska. We show off a little bit and make sure the woman officer of the deck (OD) uses the radio.

Question: With the married couples you mentioned previously, have there been any pregnancies? And what are the Coast Guard policies on pregnant women on board?

Answer: If a woman on board becomes pregnant, the policy is that she would be taken off the ship. She also can get out of the Coast Guard if she wants. We thought we had a pregnancy, this last patrol, and--well, we did have a pregnancy this last patrol. As it turned out, we discovered this when we put the young woman in the hospital in Kodiak, because she had pneumonia. They discovered her pregnancy while she was in the hospital. However, before we got back to Kodiak to pick her up, she had terminated her pregnancy due to her medical problem. She would have had the option of getting out of the Coast Guard.

Question: Do you make special considerations for your women because of physical strength requirements?

Answer: I try to make assignments of the entire crew based on rational judgment. I am not trying to be smart, but we have the same problem with men as we have with women. If a woman had a job that she couldn't physically do, I think the logical thing would be to avoid assigning her to it. I think, probably, there is a little bit of "Sally, don't pick that up, I'll take it for you" type of thing, but we have some lighter weight guys with us and there are certain jobs that they couldn't physically do either.

Question: You tell me that you have flexibility when you have 12 women out of a crew of 150 or something--are there any plans to increase the number of women on board cutters?

Answer: Adding additional ships, yes. At the present time, they are extending horizontally instead of vertically. I have no hope of getting more than 10 enlisted women. I would be happy to, but I would have to go to 20. You see, I can't really handle 11 or 12 with the physical layout of the ship. I am considering recommending that the number be increased to 20.[20]

Question: Would it affect your capabilities because of average physical strength differences?

Answer: My XO says that, if we could get 75 women and 75 men, we would have the happiest ship in the service. I am trying to think of real jobs where strength is required--securing lines, mooring lines. The biggest problem with the mooring line is with the single guy you always get on the end of the pier who can't get the line up on the edge of the pier and get it on the cleat. But on a ship, you always have three or four people on the line. I don't know at what point you would have to say, "Whoa, I need more strength." Some of the women are much stronger than some of the men.

Question: On the question of combat, you basically indicate there is no problem. What if you are thrown in with the Navy, fighting a war, and people are shooting at you? Would you like to hypothesize about the impact on your capabilities and upon the attitudes of the people--men and women?

Answer: I figured somebody was going to ask that question. To begin with, that is an area where I have no experience, obviously. Fighting submarines is no problem, unless the submarine punches back. In the Navy exercise we participated in, there were no problems; the women had a great time and really enjoyed it. They got very enthusiastic about it. What happens when you are strafed or take a hit and you have injured people? If one of those people lying on the deck is a woman--will people go to her aid rather than stay and defend the ship? People are more concerned about that now. They used to be concerned about "Well, you don't have enough head space," but that has pretty much been proven to be wrong. What would be the reaction of the country or of shipmates to killing women or injuring them? I really don't know the answer. Aboard ship, reactions will be a very individual thing. Some women will act differently than others. There are people concerned about what the men are going to do, or whether they are going to want to go into battle with women. Or are they going to be protective of them? Is that going to decrease the readiness of the vessel? I don't know; that is a tough one.

Question: What was the quality of the ten enlisted women you received?

Answer: I think the initial group could be considered to be a cut above average. I have the feeling that the quality of the input to the Coast Guard was good, because we have limited the number of women we would take. We were able to be more selective in our recruiting of women than we were with the men. That is no longer true; there are no longer any female recruiting quotas. I have noticed a difference with some of the more recent people that have come aboard but, again, it's personalities. Some are outgoing, some pick up on things faster, others appear shy and very quiet, and I think if I turned suddenly and said "Boo!" to one or two, they would jump over the side. Some of the male seamen might do the same thing. You must remember that I am dealing with a very small group of people, too few really to draw any generalities. From a disciplinary standpoint, there have been very few mast cases with females, as opposed to the male population. I think there may be a message there, too. I think there may have been a couple of times

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[20]That recommendation was subsequently made.

that a woman should have been put on report, but wasn't. I don't know, in my heart, that that isn't so. I would hope that anybody that is deserving of being put on report will be put on report, and that some senior, whoever he is, would not say, "Well, I'm going to do you a favor and not put you on report," for whatever reason. Or say, "I don't want to get the women in trouble with the skipper or the old man, since he's so proud of them." I would hope that isn't so. But it may be. I do know, for a fact, that the number of disciplinary cases is far fewer for the women than for the men.

The number going on sick call--going to sick-bay--for motion sickness dropped. The women wouldn't go because they wanted to show they can take it as well as the men, and the men weren't about to go because they didn't want the women to see them in sick-bay for seasickness. However, that gives me another problem. I wonder if somebody is going to do something dangerous, to show off, with women around that he wouldn't do on an all-male ship under the same conditions. I can't point to anything as an illustration one way or the other. But I think there is a possibility that something could happen with women aboard ship; that is, one of the guys would do something that he probably shouldn't do.

Question: Is there a ship's order mentioning sexual relations aboard ship?

Answer: No, there is no ship's order concerning that topic. The women got together and they came up with a "Code of the West," saying they were going to cool it. They don't wear perfume, eye shadow, paint their fingernails, etc. We had nine officers riding us back from Kodiak to Alameda 3 weeks ago, and one of the women officers came on board with a very noticeable perfume. I walked on the bridge and I knew she was there. The women on the MORGENTHAU haven't been doing that. When they are going ashore on liberty, they wear makeup, but when they are on watch, they do not. There has been no ship's order or anything that says, "Thou shall not wear perfume."

I will relate a little story that probably was a big help in getting the ship to accept the women. The very first Alaskan patrol since the ship had come around from the East Coast was in October, November, and December (1977). The ship's boilers broke down and so did the ship's evaporator--even when the boilers were working, the evaporator was down. There was no heat and very little fresh water--no steam, no showers, only paper plates, but yet the ship stayed out on patrol. The hardship of having no heat and no showers gave the women a chance to show, "We can hack it--we can do it." The ship moored at St. Paul's Island in the Pribilofs, up in the Bering Sea. The CO of the local Coast Guard Station came down to visit the ship. There are about 600 people in St. Paul's Island, I guess, and this handful of Coast Guard, but they have fresh water. They have hot fresh water, ice cream and different movies, and all kinds of good reasons to go up and visit that Coast Guard Station. The CO invited all the women to come up and have showers. And the women said, "No!" That experience helped weld the crew together. It was a pretty tough 3 weeks.

Question: In the Navy, from what I have been able to tell, the general pattern is that, when you go on liberty, most people go with the people they work with or in their same grade. Does this hold true with the women? Do they stick with their division mates or do they go in groups of all the women?

Answer: The women do not go out as a group together. They go in a mixed group--usually two couples, or that type of thing. As to whether there is cross fraternization between departments--I'm trying to think of examples of this. We had a real wingding of a ship's party in Kodiak last trip. The women complained that there weren't enough of them, because they couldn't get off the dance floor--everybody wanted to dance. Now we were the only ship that could have a ship's party in Kodiak and have anybody dance in the

room. People generally tend either to sort of pair up or to play the field. I can't think of a pattern that would say that boatswains mates are supposed to stick with boatswain's mates or seamen stick with seamen.

Nobody has asked, but one of the marriages was an officer-enlisted marriage. One of the women officers married a first-class. She stayed and he was transferred off the ship.

Question: Do you feel any resentment by the male and senior JGs toward the women officers?

Answer: I am dealing with only two female officers and I don't want to get into personalities. As far as the wardroom goes, the Coast Guard is kind of unique in that we have a very high percentage of academy graduates in the officer corps. For example, in my wardroom, most of the junior officers are academy graduates who share a common heritage of 4 years in New London. Also, there are the warrant officers who have come up through the ranks. Generally, the warrants are outstanding people, and they have a heritage of being in the Coast Guard for a period of time. Then there are some other people who go through the OCS program and get reserve commissions and are on active duty for 3 years, or whatever. They may get extended and they may integrate into the Coast Guard or get out. That individual has the hardest time in the wardroom. He was a civilian until he went to 90 days of OCS. He comes aboard and doesn't share the background in the Coast Guard the other officers have. Because of the makeup of the wardroom, you are likely to have one or maybe two of these officers. They have to prove themselves; they have got to break in. They are "one of those reserves" that everybody hears about. If you make one of those reserve officers a woman and also make her the first woman and throw her on the ship, you are compounding the hurdle that she has to jump over in order to be accepted. It is even more difficult for her if she is a little junior to the normal ensign who comes aboard. You don't expect the usual ensign to know anything, but she will be expected to know quite a lot because of her seniority. So they have faced more of an adjustment than their male shipmates, from several different angles. It should disappear as we get women graduates from the academy.

Question: What do you think of a wife marrying the same rate or rank and serving aboard the same ship? Apparently, there is no policy against it.

Answer: Yes, there is a policy against their both being aboard. I guess people are concerned about a sexual relationship, whether they can have joint quarters or staterooms together or that type of thing.[21] I suppose that it would be better to avoid having married couples aboard, if you could. If they both wanted to serve aboard the same ship, I don't know--I am changing my thinking. A year ago, I would have said, "No Way!" Now I don't know--I really don't know.

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[21]They would, of course, forfeit their BAQ (quarters allowance), and that's enough reason, normally, for requests for a transfer by one or the other.

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FIELD OBSERVATIONS CONCERNING INTEGRATION OF WOMEN INTO THE MILITARY

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Let me tell you a little bit about my organization, why I am doing what I am doing, and how I got to doing it. I am in what the Air Force calls Studies and Analysis. Basically, we are client-oriented. My ultimate boss reports directly to the Chief of Staff. This gives the organization the flexibility of being the honest brokers on issues. When I first started to work for the Air Force 3 years ago, I began to look at pilot retention problems. One of the military airlift commanders asked me to look at the problems first hand. It was suggested that I go with the pilots, see what they were doing, see what their lives were like, see what the irritants were out in the system, and come back and tell what I saw. Then somebody said, "Oh, by the way, while the crews are resting, why don't you take the time and see how the women are doing around the world?" So it gave me a unique opportunity to get to practically every air base in the world. As a result of that, some Army leaders asked me to go to Europe for the REFORGER exercise, as long as I was flying with Air Force REFORGER crews, and see how the women were doing. So, my study of women in the military has mushroomed.

At any rate, I began to look at women's issues from a managerial perspective. This differs in that most issues at that time concerned strength, attitudes, and ability. Now, with women in the military academies, people ask, "How about women in combat?"

Can women do the job? What can she do, and what can't she do? This leads to questions concerning the historical evolution of women's roles--whether schools taught them to run, to do calisthenics, or whatever else. What could a woman do physically? What could a woman not do because she didn't have the proper exposure to activities? How much relevance did that have in terms of the job? Should the tool box be in three pieces instead of two pieces, and so forth?

I think a lot of the studies we were doing were micro; each one was relevant to the issue, but not useful in answering the big question of how putting women into the system would impact on the mission. There was really no precedence for this movement of women into the military.

During World War II, women came into the military and into nontraditional civilian jobs in great numbers, but their roles were really to fill in for the men as the men went into the more combat-related jobs. However, the women with children were living at home--they were not mobile. Those without children were often mobile. We had women in the Women's Airforce Service Pilots (WASPs), but there was never a question of which women were home doing a job, plus caring for children, or were actually getting into the wartime environment. Then again, when the war was over, the women went back home, so there was never really a question of the role of women being integral to the total military. Therefore, anything we have done in the past couple of years has been basically without precedent. The expanded use of women has also come at a time when there has been a great movement for equal rights, women's lib, or whatever term you want to use. We have been experiencing the need of the all volunteer force to meet its personnel numbers at the same time that social pressures were demanding equal rights for women.

I think one of the main concerns left out in deliberations about moving women into the military was the military mission. What are the demands of the military mission, and

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how does that impact on the total family? As I went out into the field, I began to see that a lot of the problems were not questions of whether a woman can do the job or not but, rather, of how we manage to recruit, train, and assign women throughout the system. So many tumultuous things were happening. We were increasing the numbers of women, we were expanding the jobs they could go into, we were expanding the sites they could go to, we were implementing policies--policies about marriage, being able to have children, and so forth. All of these changes were coming at one time, and we never really had a chance to digest how each change was going to impact on everything else. It sort of all came together.

In terms of sheer numbers, our concern should be with enlisted women, rather than with women officers. Additionally, women officers coming into the military are now coming from sources such as the academies and ROTC. They have been away from home, they have had some independence, they are career-motivated, and they have a good idea of what they are getting into. The women officers have a much better perception of the demands of the military and the demands on a person to be independent than do the enlisted women. The young enlisted women, if you talk to them, are basically coming from poorer families. The military becomes an option offering job security, job training, and a legitimate way to get away from home. They can't afford to go to college, they can't afford to travel, the Peace Corps is totally out of their realm. So what happens is that they are joining the military for some very basic reasons.

Question: You are saying they come from poorer families. Do you mean, poorer families than do women officers or poorer families than do their male counterparts?

Answer: From poorer families than officers in the sense that those who can't afford an education will come into the military for the training and education that they couldn't get in the outside world. Also, as we move them into the military, we are moving them into jobs about which they really have no conception. There was a dual reason for moving women into new military jobs. It was not just because of the women's movement. It was because of serious personnel shortfalls, which usually were in the very unpalatable or less desirable jobs. The goals of the recruiters were to fill up the jobs that people weren't standing in line for. The recruiter would say to the women, "Hey, listen, you may have a 6-month or a 2-year wait to get into this (traditional) career field, but, look, avionics is open, mechanics is open, electrical is open and we guarantee your enlistment if you'll take this field." Now, the first women that came into the nontraditional fields did very well. But when you had a lot of young women coming in, through this great recruiting emphasis, some women were placed in jobs they didn't like. What happens to any young man or woman when they don't like what they are doing and they can't get out of it? They are going to get into behavioral patterns that are going to get them out of it. Now if you are going to get drunk, or you are going to get on drugs, you get out with a dishonorable discharge. But if you get pregnant, you get out with a honorable discharge. So what happened, as the women were moving into the jobs that they were not happy with, is that the pregnancy rates went up--there is just not any question about it. One of the reasons used to open more jobs to women was the fact that, even with pregnancy, women had better attendance rates than men. At that time, that was very, very true, because if a woman becomes pregnant and she is in a desk job, there is no problem in her working until the last day--if she is happy in her job, she is going to work until the last day. But if she begins to manifest behavioral patterns, because she is not happy with her job, two things are likely to happen: (1) she will get pregnant, and (2) she will use that pregnancy to get out of the job--just as a man gets into trouble in other ways to get out of the job. Another thing, which I think is really the most critical, is the fact that, if we start looking at environmental hazards, a woman who gets pregnant is not going to have to leave her job only because she can no longer lift heavy things, which was the first way we looked at

it. Instead, she is going to have to leave it because she's working in places like machine shops, paint shops, and automobile shops where fumes can have an impact on the child.

We are talking about some factors other than whether women can lift a 50-pound tool box. Those women who got pregnant and who wanted to stay in could be moved into less tasking jobs within their specialty area. In other words, on the record, they might maintain an avionics specialty. If you went into the shops, however, you might find them doing clerical work--something statistics do not reflect. If you looked at the statistics, you would find that the women were doing great--they were staying in the specialties. In addition, women were outscoring the men in their tests for promotion. One of the reasons was that they had a lot of time to study for those tests when they were sitting at the desk jobs, and the guys out on the flight lines didn't. Consequently, you had women passing the tests with high scores and the men not doing as well, but the men had the practical experience and the women did not. Frankly, the minute the women got that promotion, they were requesting to get right back into the traditional jobs.

Goals for recruiting women into the military have been, I say, very unrealistic. We set up quotas in all the different job areas and the women were moving out of some of them as fast as they were moving into them. The women who are now in these jobs scored much higher on their avionics and engineer tests than did the earlier women. They are therefore staying in somewhat longer, but there are not the numbers that we saw a couple of years ago. The real truth is that they are not standing in line to get into the nontraditional jobs. Again, I am describing the people that we are recruiting into the enlisted corps. They are coming in with traditional values, and they do not want the alien male world.

I have noticed some leadership and management issues associated with women in the military. It is claimed that a woman officer will be tougher on a woman than a man will be. Therefore, the woman gets the tough image. The man may not demand professionalism of a woman. By doing this, he is denying the woman the opportunity to become a professional while, at the same time, he is helping to perpetuate antagonism toward women not doing their jobs.

The women have learned to manipulate this just as the men have always done. The men will be very paternalistic to the women and it becomes very easy for the women to use this to get out of having to live up to their responsibilities. I see this as a real two-edged sword. It not only hurts mission readiness, but it is really denying the women the right and opportunity to become real pros. This just helps to perpetuate the question of whether women should be placed in nontraditional jobs as required by the expanding role of women in the military.

Let me discuss basic training. When we used to have single gender training, a lot of the problems we now have did not occur. Basic training is a transition period from a less disciplined world into a more disciplined world. Every time we cut down that basic training time because we can save money, we are cutting down on that period of time that helps new personnel to make the adjustment to military life. In the old days, everybody knew it was a pretty rotten period of time. It wasn't fun, you got harassed, you got harangued, you had to learn to grin and bear it, you had to tough it out, and no young guy was going to go home and cry. He had to learn to use his inner resources, develop strength, and so forth.

Now, we have integrated the basic training and what has happened is that boy meets girl, and it has become very easy for them to turn to each other and develop dependent relationships during this crisis period--and it is a crisis period. Unfortunately, this

precludes the young people learning how to tough things out and how to become self-resourceful. To compound that, the system has created policies for equal opportunities that result in people using (in the pejorative sense) the system. Now it's boy meets girl, plus: "Hey, let's get married, because if we get married, we can get two basic allowances and we don't have to live in the barracks."[22]

Go out into the field and talk to people who know you are not wearing rank. They will look you straight in the face and say, "I've never lived with my husband--we've got a deal, we're going to get a divorce." They will get married sheerly because they know that one is getting assigned to one base and the other is getting assigned to another base, so one says to the other: "I want to go to Barksdale, it's really a neat base. You're going to Barksdale so let's make a deal and get married." This is very much a part of the driving force of going from basic training into marriage: "If we get married, they've promised to put us together--they'll do everything to put us together." I have talked to kids who have known each other only 2, 3, or 4 days (remember the stress in basic training), and decided to get married. These marriages then become a guiding factor in the management of our personnel. You talk to a lot of single people or people married to nonmilitary personnel, and you will find that the emphasis on managing married military couples is becoming a real irritant in the system. Everything is done to move the spouses together, which could mean sending somebody else out or moving somebody else in, or changing their assignment, plus the fact the couples don't have to live in the barracks.

So you have a lot of marriages starting out at basic training that have very shaky foundations. Many of these kids have never been away from home before, so these relationships become the substitute for family relationships. From there on you get into the whole question of two young enlisted kids getting married, perhaps having a child, and having to meet mission requirements. How can they do it?

I was in Europe during an alert and found that people were not coming to work because somebody had to stay home with the baby. Because the cost of living is unreal, and the young enlisted kids cannot get on-base housing, they live way, way off base. They have very little money, and you have a lot of wives sitting at home all day long with nothing to do. In the case where both spouses are military, the babysitting problem, particularly during the crisis time, becomes unmanageable.

The mission is really being affected. There are children running around during alerts. The services have policies that say, "You must show proof that somebody has the power of attorney to take care of the children." The results of one survey indicate that 70 percent of the people never did anything about child care arrangements. They would get a parent to say, "Yes, I'll do it." They never thought it through because they think that: (1) "there's never going to be a war" or (2) "if there is a war, I'm going home with the kids." Again, what are we going to do about mission readiness?

A lot has fallen on the shoulders of the military in terms of trying to attract and recruit people for the volunteer force. We have changed a lot of policies and made a lot of promises, without giving realistic expectations to the new personnel. We have never said what the mission requires and, therefore, the young people don't understand what the mission requires.

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[22]In January 1980, the U.S. Comptroller General ruled that two enlisted people who married primarily to pool their quarters allowances can be ordered back into single quarters and lose their basic allowance for quarters.

I have done some flying recently with the Military Airlift Command (MAC). We are now putting enlisted women on some planes as boom operators, flight engineers, load masters, and so forth. During the REFORGER exercise, the weather was bad, both in the States and in Europe, so MAC crews were being stacked up, sitting around for days on end until they could get the missions going again.

Now, what happens to child care in a case like that? Can we afford to have either a woman or man say, "Hey, I can't stay in the system, I've got to go home, because the babysitter can only stay for a week," or "My husband has to go out on a mission and he's home with the children." What happens if the kids get sick?

Daycare, up until now, has been the room where you take the little children and they play all day. If our military people are going to stay through a career, the demands for child care will be greater as the children get older. If we don't have afternoon activities and the resources to watch the older children, we are going to start running into big problems.

At one time, the mission came first. However, since the family comes before the mission for the people in the all-volunteer force, one has to look at how this impacts on readiness. Mission readiness is the bottom line in terms of addressing the whole question of employing women.

Question: You mentioned you have talked to people who have known each other only 3 days and gotten married; you might just turn that around and say that is coping. I hear what you say about not developing the internal toughness, but I guess I shudder at the bureaucracy coming in and deciding how to manage that. It might make it worse if somebody comes in and says, "Okay, nobody can get married during boot camp."

Answer: We have not done a good job in terms of counseling young people and giving them the realities of what their mission requires. The point is, they have not learned to cope, and crisis begins to hit when they have the first child and they are not mature enough to take care of the child and manage their jobs. In many cases one of them will get out of the service--generally the woman. I have talked to husband and wife teams and asked, "How do you feel about your wife working?" The usual answer is, "That's okay, but she's getting out of, say, the security police--I don't want her having to deal with men," or "No wife of mine is going to work if she has a child."

Question: You paint a pretty desolate picture, and I guess you have spent a lot of time in the Military Airlift Command, but do your arguments apply to 8:00 to 5:00 military jobs?

Answer: Well, first of all, I paint it this way because I think we have to become more realistic. When the Air Force began to change its recruiting films last year and I was asked to review them, they showed bad weather, the women getting their hands dirty, and so forth. A general officer sitting next to me said, "Oh, that's terrible! We are not going to get the women to come in." And I said, "Well, that's fine. It will save us a lot of money, you know, for the ones who would get right out." I am not trying to paint the picture that women can't do it, but I think we have to come to grips once and for all with the realities of the military mission, and then adjust to that.

Okay, to your next point--the 8:00 to 5:00 jobs. If the military begins to micromanage to the point of saying, "Okay, those with kids get 8:00 to 5:00 jobs," you are going to have a disaster. When you go into the military, you understand that you can be moved at anytime, that being ready means that you are available for duty 24 hours a day, period, even if you are in an 8:00 to 5:00 job.

What I am saying is not that women should not be in the military, but that the mission is primary. I am saying we have to become much more realistic in terms of what we are offering and what we are expecting. We may reduce the numbers of women coming in, or we may have to change the kinds of policies we have. That does not preclude women serving, but there may have to be some hard lines drawn in terms of those with children who are going into particular jobs. How well can they really cope? That's not just women; it also includes men as single heads of household.

There is another issue here. Women now have careers. They are earning $50,000 or $60,000 a year, and they are into every career in the world. As a result, they are saying to their husbands, "You can go alone on that next assignment."

That is a driving factor with pilots and it is a driving factor with the whole military. It is a very important one in terms of what comes first, the family or the mission. Does this preclude women from the military? No. We might have to get into some kind of mode that says the military will not invest expensive training for the first 2 or 3 years that a person is in the service. Male and female can come in, you can do certain jobs, and we will make some investment in your career. If you are going to stay in, and you are realistic about your expectations, then we will make additional investment in you.

An area that I find very interesting and that needs a lot more research concerns officers, such as 30-year-old captains married to each other--particularly in the Army, where there is a rather prescribed role for the wife. The wife has a prescribed role in terms of her social work, her charity work, the entertaining, and what she does because of her husband's role. Now, both husbands and wives are beginning to get commands, and the wife will say, "I have no wife to take care of my needs, and one of us is denying the other the support role requirement that still exists in the Army."

So you begin to get this competition of whose career is going to come first. It's the time that they start getting chosen for schooling, and in the Army you just don't get promoted unless you have been through the school system.

What happens to the one who gets that school assignment and to the other who doesn't? What does it do to their careers? Another point: The woman will look at you and ask, "I'm 30 years old and this is the period of my life where I have to decide whether to have children or not; I can't delay childbearing much longer. Am I going to think, in 10 years down the pike, what did I give up for this career?" I am not saying it is right or wrong. I am not making a value judgment. All I am doing is reflecting what I am hearing from the people who are in the situation.

Question: What kinds of specific suggestions would you make for those people who are in that situation? Other than counselling them and rejoining the couple that they live in a tough world?

Answer: Well, should we go to something like the Kibutz in Israel? We have to start addressing child care needs in terms of, not only from 8:00 to 5:00, but also during emergencies and alerts. When we talk about alerts, are we talking about 3-hour alerts, where you open facilities and everybody can drop their kids off? Are we talking about a 1-day alert, or are we talking about going out in the field for indefinite periods? We have to come to grips with it. I am not saying it is just the responsibility of the person in the military. What we have neglected to do is to educate and inform the people in the military concerning what is expected of them. When you go overseas and you start talking to young people who tell you that they know that they can go home the minute the war starts, then you know that we have done a poor job of telling them what they are out

there for. Are we, as military services, prepared to take care of children in terms of dressing, feeding, clothing, schooling, health care, etc.? These are the kinds of questions that we have to address. But it is the same point: Anybody coming into the military must understand what is expected of them.

Question: Some of the costs of 24-hour emergency operations are now appearing for the first time. They have just been hidden before from the military accounting system. Broken marriages don't show on any one accounting system in terms of human cost, and yet personnel experience them. Broken families, alcoholism, drug abuse, child abuse--we have to pay attention to these problems now because the families are integrated in the military and the costs are much more visable. Many of these things interfered with the mission before we were paying the cost. Wouldn't you say that the military just wasn't recognizing these costs and was willing to let the personnel live with them and cope with them as best they could?

Answer: Well, you are absolutely right and what was happening was that the wife back at home was coping with it--or not coping with it.

Question: Do you see a difference between younger enlisted and older enlisted women?

Answer: Yes, there is a difference between older and younger women in the military. The older women in all three services came in with a totally different set of rules. Many of them, while you feel they might be frustrated because they can't do some things, are just overwhelmed with the changing demands. The biggest loss to attrition is from captains to majors, and from the E-5 level and up. Women used to get out because they wanted to get married and have children, so they got out of the system. However, if you go back and talk to a lot of the women that got out in the early 70s, you'll find that the major reasons why those women got out were because the rules of the game had changed and they were overwhelmed. In the past, women who had come into the services, expecting to be an adjunct to the service, were told to be ladies and to do this and that. Now, they are told that they are going to lift rifles and run 3 miles a day. That was very overwhelming to those women. That was the major reason why they dropped out. I find, from talking to a lot of the senior women, that they are very confused right now, because so much emphasis is being put on the management of all the other issues (i.e., the families, children, marriages, joint spouses, and so forth) that they feel neglected and shunted aside. The younger women are saying, "I don't want them for a role model," and "We don't have any senior women in any policy-making positions who have been married and have children." There are really no senior women who can reflect and understand the needs of the younger women. Yet, on the other hand, the younger people have sort of looked at those women and said, "They're not what I want to be--they're not my cup of tea, they don't do what I do, they're really tough on us, they're more male than female, etc." I think time will take care of that, but we need to understand the roles of the more senior women and what they sacrificed in order to survive in the system.

Question: I think there has always been a need to strike a balance between your job and your family, and the way you strike that balance and the priorities you set will determine how well you do in each because one will take away from the other. I think women aren't taking that into consideration. They are getting pregnant and then they are turning to the military to say, "Give me more time. Give me a chance--not only to give my children time but also to maintain my job." It's not something I think we can help them with. We can have child care centers and we will help them out, but I don't think we'll solve it.

Answer: That is what I meant in referring to realistic expectations. I have done a lot of work with women in other countries and I think the best example is the Israeli women. Much to everybody's surprise, the Israeli women do not fight or go into male-oriented jobs. They have a 2-year military commitment as opposed to a 3-year commitment for men. They are reserves only until they are 22, as opposed to the men who are reserves until they are 54, and so on. The driving factor is that the women will become wives and mothers, and they will produce the next set of men for the survival of the country. If you talk to these women, you will find that they do not want women's liberation, or to do the things we think they want to do. I think an important thing is the kind of training investment made in them. It is a very basic transitional training so that they can go into the jobs to serve. Now the Israelis have run into manpower shortages in the last few years, which have forced them into the situation of having to recruit the women into some of the nontraditional jobs.

Those women going into nontraditional jobs have to agree to certain new rules. They will no longer have a 2-year commitment but a 3-year commitment. If they get married, they cannot get out of the military, because of the training investment that the Israelis are putting into them.

Question: Could you make some comparisons of the women enlisted and the women officers who are coming into the U.S. military?

Answer: The numbers we are talking about are in the enlisted ranks, and they are still coming in with traditional values. Their goals are getting married, having children, having security--they are not viewing their jobs with the military in terms of careers, but as they would any other job that they would get in society. It is a transitional period to meet the man they are going to marry. They do not have the same goals as the women officers. Now an interesting thing that I have come across, in terms of self-confidence, is that I have found that the enlisted women are far better "put together" than some of the women officers. It is due to the same phenomenon found elsewhere. Where there are greater numbers, they learn to support each other and "the queen bee syndrome" immediately disappears. Those women who try to get ahead via female wiles are put down by the other women very quickly. Also, if 50 percent of your force are women and the men are rebelling because they always get the night watch, they are going to put the women on the night watch. So these women support and learn from each other, and move into the system. They are also learning that they can be in these jobs and still be feminine. This is a very, very sensitive issue: Must we give up our femininity to be successful? What I find with the female officers is, because their numbers are so small and they get dispersed into jobs so far spread out, they find themselves very lonely, isolated and insecure, and still do not know how to operate in the military world.

Now, let me give you the other side of the coin. I went to a remote base last summer and there were 30 women officers at that base. They were the most professional women I have seen in all of my various visits. They covered every kind of field, and some of the toughest jobs. The enlisted women were also fantastic. There was something about the remote experience that eliminated a lot of the conflicts. Everyone knew they were there for a year, they would be working long hours, and they would all live in a barracks.

Because of the opportunity to develop as a professional, I think more and more of those women were extending their stay, which expanded their numbers. An interesting part about this experience concerned the problems stemming from spouses (both in the Air Force) living together. What happens to the single people and to the married people who are away from their spouses? They accept the fact that this is a year that they are away from their families and they make certain sacrifices as part of their commitment.

They know that people have to live without their families in this environment, and so everybody develops a comradeship.

Question: On a ship of 150 people, a small ship, what do you say would be the minimum number of women you should have to get out of the "queen bee syndrome" you mentioned, or to attain the professionalism you saw at the remote base you mentioned?[23]

Answer: Well, I am scared of giving you percentages. I don't believe in quotas, and I don't believe in bottoms and ceilings. I don't want to say X percent of the force is what we need, but I would rather see them clustered and maybe have some areas that do not have women at all. Cluster them in enough of a concentration so that they are successful. As women become successful, they become the best role models for the future women. I think, if you are talking about putting women out to sea as opposed to just aboard ship, it's going to be important to have enough numbers, somewhere around 10-15 percent. I think it's going to be very important for them to be able to support each other. Now it may be that in some skills you don't have any women. But in those where there are women, there should be enough to allow them to support each other. Once when I was on a Navy ship, one of the young LTJGs said to me, "I think the best thing to do when we get women aboard ship is to have a married couple there." Now I think that would be the worst thing in the world. When you are in a confined area, the last thing you need is to have a married couple aboard, while everybody else is remaining celibate.

Question: So what you are saying is, if we have a small ship and maybe no women except one officer in the wardroom, you would predict problems. There are, however, certain practicalities. On a lot of ships, you either go with one or two women or you go with all women.

Answer: Okay, in that case you are really getting down to an individual basis. I think there are going to be those women who can hack it, and those women who can't, particularly at the officer level. It depends on how confident they are in themselves when they get to that ship. If you have a woman who can be a good officer and a good leader, there will be problems, but they will not be insurmountable.

Question: If the evidence on integrating women into the military becomes negative, do you think we will be able to say, "Look, we tried it, and it doesn't work?"

Answer: If we can identify management problems and resolve them, we don't have to be driven to that point. I think the most detrimental thing today to the employment of women in the military is the fact that we have had a lot of people trying to prove that the all-volunteer force was working, and at the same time saying, "Women can do everything." By doing that, they have refused to allow us to look at the issues and say, "Yes, there are going to be problems with women, just like there are problems with men." If we would look at it in terms of management problems and identify problems in terms of management and leadership, then we could resolve them and not have to reach the point of saying we tried it and it doesn't work.

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[23]Navy policy for FY81 is that a minimum of 30 percent women is the goal necessary to counter the effects inherent in "tokenism"; 50 percent is the maximum to be assigned to any one ship. The ship type, size, and the stage of integration all affect the actual minimum, however.

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SOME RESEARCH ON WOMEN IN THE NAVY

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Today I want to describe the results of a number of research projects conducted by the Navy Personnel Research and Development Center (NAVPERSRANDCEN).

You may wonder why the Navy would get involved in conducting research on military women. After all, women have been continuously in the Navy since 1942. As a matter of fact, during World War II, they numbered more than three times as many as they do today. At times, there were about 86,000 WAVEs in the Navy, compared to only about 24,000 at the end of FY79. The difference lies in their proportionate representation. During World War II, Navy women constituted just slightly over 2 percent of our enlisted force. Now they are rapidly approaching 5 percent, and I am sure that you already know that there are plans for 10 percent representation in the Navy, and an even higher percentage in the Air Force. A problem this poses is that women can't be utilized in the same manner as men because of federal laws and service regulations that mandate different treatment of the sexes. There are also anthropometric considerations that hamper some women when working in an environment that is designed for the male physique. Thus, management, while trying to fit women into slots that were formerly occupied by men, have posed questions to the research community that wouldn't have been considered a few years ago. Military personnel managers are now asking questions such as whether it is really cost effective to enlist more women, how we go about attracting the type of woman who will want to work at a nontraditional job, and how wives and men will react when ships, or other units that were once all male, are integrated.

The early research that the services conducted was what I would call descriptive research. The Navy started a longitudinal study to track the first enlistment of a group of 1000 males and 1000 females. When group members were surveyed at recruit training regarding their backgrounds, their motivation for enlistment, and their work values, a number of differences between male and female recruits were found. For one thing, the women tended to be older, averaging 20 years of age. They were better educated, because of the requirement that all women entering the Navy must be high school graduates, and they had higher aptitude scores than the men, because service regulations state that a woman must be eligible for technical training in order to enlist. The women tended to come from very small towns, a majority from towns of 20,000 or under, and they knew very little about the military. In our research, we compared the work values of the males and females, and found some interesting differences (Thomas, 1977).

Question: You mentioned that all women have to be high school graduates in the Navy. Aren't GEDs accepted?

Answer: Yes, they are, but women without a high school diploma or GED cannot enlist, no matter how high their test scores are.[24]

Question: Do women have to be at least 18 years old to enlist?

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[24]This continues to be true for the Navy and Marine Corps in FY81. The Army and Air Force have somewhat lower standards that apply equally to men and women.

Answer: They did until 1974, when President Nixon signed Public Law 93-290 making the age qualifications identical for men and women. If a person is 17, he or she can enlist with a parent's or guardian's consent.

We had administered, to our two groups of 1000 men and 1000 women, 37 items measuring their work values. What we found was that men and women answered 19 of the 37 items differently. Table 1 lists the five job factors most highly valued by women and by men. The one most highly valued by women is a rather stereotypic feminine value that is also important to the civilian work force; namely, a cheerful and clean working environment. However, 53 percent of the men also said they highly valued a cheerful, clean working environment. Some of the other female needs appear to be altruistic, in that these women wanted to do something to help others or to make the world a better place to live, or to do something that would give them a feeling of doing something important. I think there is a message in Table 1 for human resource management people--both sexes want supervisors who care, and both sexes want to feel that their jobs are important.

Table 1

Five Job Factors Most Highly Rated by
Female and Male Recruits

Value		Percent
	Female Recruits	
1.	Provides a cheerful, clean work environment.	67
2.	Gives me a feeling of really doing something important.	67
3.	Teaches a new skill or further develops one I already have.	62
4.	Includes a supervisor who cares about the worker's problems.	59
5.	Helps others or in some way makes the world a little better place.	57
	Male Recruits	
1.	Teaches a new skill or further develops one I already have.	60
2.	Gives me a feeling of really doing something important.	58
3.	Guarantees periodic raises, paid vacations, and sick leave.	57
4.	Provides the opportunity to advance to a supervisory position.	55
5.	Includes a supervisor who cares about the worker's problems.	54

What we concluded from the study is that the Navy is attracting women with traditional work values who probably are not going to be satisfied in the nontraditional type jobs where they are needed.

Researchers at NAVPERSRANDCEN have also conducted descriptive studies on substance abuse (Crawford, Thomas, & Thomas, 1976; Olson & Thomas, 1977). Very little

information is available on the involvement of military women with drug and alcohol abuse; however, it is generally believed that, since they don't show up at alcohol and drug rehabilitation centers, they are less involved than men are. Crawford et al. studied the preservice drug experiences of Navy male recruits over a 5-year period. Every June, for 5 years, a survey was given to samples of almost 1000 recruits. What was concluded from that study, and it won't surprise you at all, is that there was an increasing number of marijuana users. Use rates of other drugs seem to have stabilized, but by 1975 over half of all male recruits admitted having used marijuana during the 6 months prior to entering the service.

Olson and Thomas administered the drug-use survey to a sample of women in 1976 so that their preservice drug experiences could be compared to those of men in the 1975 sample. Table 2, which provides the male and female drug use statistics, shows that the only statistically significant differences between the sexes were in the use of psychedelic drugs such as LSD, STP, peyote, etc. These recruits also were asked how frequently they had used these drugs in the 6 months prior to entering the service. Again, the only difference between the sexes was in the use of psychedelic drugs, with men admitting greater frequency than women. We asked them about cigarette smoking, and there was no difference between men and women in the number of packs smoked per week. There was a sex difference in preservice alcohol consumption, in that young men reported having gotten drunk with greater frequency than did young women.

Table 2

Preservice Use of Drugs by Recruits

Drug	Percentage of Recruits		
	Female (N=508)	Male (N=1252)	z Ratio of Difference
Marijuana	47.2	51.0	1.44
Amphetamines	20.7	19.1	0.76
Barbituates	14.2	14.0	0.11
LSD, STP, DMT	6.5	11.4	3.12**
Peyote, Psilocybin, Mescaline	7.3	10.6	2.12*
Cocaine	8.7	8.9	0.10
Opium, Codeine	6.1	5.5	0.49
Heroin	2.4	2.1	0.39

*p < .05
**p < .01

Question: Do men and women behave in the same manner (reporting alcohol use) in the service?

Answer: We don't know.

Question: Was this survey you are describing answered anonymously?

Answer: It was administered anonymously.

Question: When were the surveys administered?

Answer: For the males, the table shows the results of a 1975 administration; and for the females, a 1976 administration. This would suggest that, if we had 1976 data for males, some of the use rates would be higher. There was a lie scale in the survey, by the way--a wholly fictitious drug was included. Responses to that item weeded out one percent of the women and three percent of the men who admitted using the "drug." As I mentioned, there are two NAVPERSRANDCEN reports published on these data. One report describes the results from the men, and how these results relate to different background variables, like race, education, high school grades, area of the country they came from, etc. (Crawford, et al., 1976). The other describes similar analyses done on the data obtained from the women and compares results with those obtained for men (Olson & Thomas, 1978).

The last of the specific studies I will talk about has to do with the reasons for women to be discharged from the Navy (Olson & Stumpf, 1978). Historically, women have been separated at much higher rates than have men. There are two reasons for this. the first had to do with the more lenient discharge practices applied to women; and the second, with specific policies--the most important of which concerned pregnancy. Until May of 1975, a woman was discharged when she became pregnant. After this policy was discontinued, we wondered what effect there would be upon the separation rate of women. The sample of 1000 women and men I talked about earlier had been in the service for 2 years by June of 1977. Personnel data tapes were used to find out how many were still on active duty, and why those who had left had separated. Table 3, which provides results, shows that the separation rates of men and women are virtually identical, now that women are no longer separated because of pregnancy: 26 percent of both women and men were discharged in their first 2 years of service. The sample sizes in Table 3 are for separated people, out of the original sample of about 1000 of each gender. The reasons for separation, which are also included in Table 3, are exceedingly different, in that the majority of the women were discharged under honorable conditions, but this was not true for the men. If you agree with the premise that a less than honorable discharge usually means that nonproductive behavior was involved prior to getting that discharge, then I think you will have to agree with me that the women were probably more cost effective while they were in the service. Table 3 shows that "unsuitability" was the most frequent reason for discharge for men. Forty-one percent of the discharged women, not 41 percent of the women in the sample, got out because of pregnancy.

Question: Could you generalize the data in Table 3, to say that, of those males joining the Navy, only 30 percent get honorable discharges?

Answer: Of those who got out in the first 2 years of their enlistment, only 30 percent got honorable discharges.

There is one more thing I ought to discuss. In the era when this group entered the service, a pregnant woman had a choice: (1) she could have the baby or an abortion and remain in the Navy, or (2) she could get out of the Navy. So the 41 percent of the 258 women shown in Table 3 who were discharged due to pregnancy must have wanted to obtain a discharge. An exit questionnaire was inserted into the service jacket of every woman in the sample when she first entered the Navy. The responses given to this questionnaire by the women who became pregnant and got out of the Navy revealed that they wanted to spend all their time being mothers, and they were no longer interested in a Navy career. The other women, those who received honorable discharges but were not pregnant, said their primary dissatisfaction was underutilization in their job.

Table 3

Type of and Reason for Discharge for Cohorts Enlisting in 1975 (N=1990)

Item	Female (N=258) %	Male (N=264) %
Type of Discharge		
Honorable	83	30
General	8	48
Undesirable	--	4
Released to inactive duty	9	14
Declared deserter	0	2
Bad conduct	0	1
Died	0	1
Total Discharge Rate	26	26
Reason for Discharge		
Pregnancy	41	--
Unsuitability	35	30
Convenience of government or enlisted in error	8	8
Misconduct or deserted	4	17
Physical disability or died	3	7
Released from active duty	2	10
Good of service or fraudulent entry	1	4
Other reasons	1	5

Table 3 demonstrates the fact that men and women are prematurely leaving the Navy at unacceptably high rates. Moreover, looking toward the future, the luxury of accepting the most highly qualified women will soon pass, because of the increasing number of women being enlisted into the Navy. Soon recruiters will probably have to go a little bit farther down the aptitude scale in making selections.

After the sample of 1000 women had been in the service for 18 months, their entry questionnaires were reviewed to see if there were differences between the responses of those who had stayed in the Navy and those who had gotten out. This questionnaire had been designed to collect data concerning female role ideology, personal history, mental health, motives to avoid success (a big thing in psychology for awhile), expectations about the Navy, enlistment motivation, and work values of the sort shown in Table 1. Only three of these areas were useful in predicting those who would leave: Personal history, mental health, and work values.

If I were to speak of the background of a typical woman who didn't make it through 2 years in the Navy, I would have to say she had had bossy teachers and a neglectful mother, had experienced severe childhood punishment, and didn't date frequently. She believes in bad luck, reacts poorly to stress, trembles when anxious, has frequent headaches, and experiences difficulty in sleeping. Her work value items showed that she does not value a caring supervisor or interpersonally-oriented jobs. She does value calmness and working in the out-of-doors. I think this description gives you the feeling of someone who has difficulty in interpersonal situations.

Question: How could you use such findings?

Answer: We could decrease attrition by 10 to 25 percent by using these types of items to weed people out prior to accepting them in the Navy. The problem is that the questionnaire was administered to people that had already been selected--brand new recruits. After it has been demonstrated that the items might be useful, they should be given to an applicant population.

Question: Would you actually select people for enlistment based on their answers to these sorts of questions?

Answer: Well, we wouldn't single anyone out based on their responses to a screening test until it was validated. What could be done is to prepare a test, a much shorter version of what was given for research purposes. Now that the concepts that are predictive are known, a short test could be given, and the people could be tracked for a couple of years to see if the test was predictive of attrition. If it held up, then we would recommend that the Navy use this screening test for selecting recruits.

Along with psychological screening, the need for physical screening is emerging because women are moving into jobs that many of them may not be able to handle physically. The problem in the Navy is a little bit more complex than it is in industry, because there are not only job-related tasks, but also general military tasks that occur aboard ship. The Air Force was the first to recognize this need and developed what was called an X-factor. What the X-factor involved was simply the ability to lift a certain weight to a certain height, and people were classified as X-1, 2, or 3. Then, all the Air Force specialties were assigned to groups 1, 2, or 3, according to how much lifting ability was thought to be required on the job. Since that early method was implemented, both the Air Force and the Navy have embarked on projects to come up with a more refined physical screening system.

Recently, the Air Force completed a task analysis on their aircraft mechanics section (Christal, 1978). What I'd like to talk about, however, is not the strength requirements that were found, but something else very interesting that came out of the study. The analysis revealed that people who are in this aircraft mechanic specialty are performing one of two types of jobs. They are either working in maintenance or they are working in the support part of the aircraft specialty. When the support tasks that these people were performing were tallied, it was found that women were doing more of the organizing, planning, and implementing than were the men. On the maintenance side of the house, women were doing almost exactly the same thing as were men. In maintenance, the correlation between the amount of time men and women spent in doing these tasks was .97. For the support tasks, the correlation was .69. These people had been matched on time in service, so that the male and female pay grades and experience would be approximately equal.

When the women had enlisted in the Air Force, it was possible to qualify for training as an aircraft mechanic by scoring above the 50th percentile on either the mechanical

composite or the electronic composite of the aptitude test. Today you can only get into that specific job by scoring above the 50th percentile on the mechanical composite.

Table 4 shows what this means and how the groups looked on their aptitude scores. As you can see, most of the women must have gotten in by qualifying on the electronic composite. In other words, at least 50 percent of the women who were aircraft mechanics in the Air Force are "not qualified" for training as an aircraft mechanic, and 75 percent of these women are performing the same maintenance tasks as "qualified" men. The reason I am discussing this issue is because it represents a barrier that women face in all of the military services. Throughout DoD, the Armed Services Vocational Aptitude Battery (ASVAB) is used to classify recruits and the ASVAB has been accused of being biased against women. Because not enough women are in certain nontraditional jobs to validate the battery, the services are operating under the assumption that the composites that are valid for men are also valid for women. As a result, something unfair is happening, at least with aircraft mechanics.

Table 4

Aptitude of Aircraft Mechanics

Composite	Mean	
	Male (N=5825) %	Female (N=206) %
Mechanical	68.9	39.2
Electronic	64.5	60.7
General	60.7	69.9
Administrative	47.6	63.4

Question: You say that the women who are "unqualified" are doing all right?

Answer: Yes, there was no difference between the male and female performance ratings.

Question: Haven't we just about been convinced by now that there is not that much difference between the sexes in terms of aptitudes?

Answer: Yes, but the ASVAB has tests dealing not only with aptitude, but also with achievement. This is true of four of the tests in the ASVAB. The Navy was assigned two of the ASVAB tests to work on, and one of them was the electronics information test. I couldn't answer a single item on that test. The mechanical information test is rather typical, with questions about pulleys and what will happen if you turn a gear this way, and so on.

Question: Wasn't there an automotive information test?

Answer: Yes, there is an automotive information test too. There are about four tests that are based on past experiences or knowledge that you've gathered up to the 12th grade of high school.

Question: You talked about pulleys and things. I remember those tests, but I learned about those in physics class. Aren't girls attending physics classes?

Answer: Probably so, but when I went to school, the number of girls who enrolled in such classes was certainly much lower than the number of boys.

Question: How can you figure out a person's aptitude for mechanical or electronic work? It seems to me that the ASVAB may not be perfect, but it's something.

Answer: The way that I would go about doing it is, first of all, to let people try. You have to let people into the training phase--to open the doors. Everybody coming into the services would be given the proposed tests and attend school. When it was all over, we would look at which of the tests, or combination of tests, predicted performance in schools. Some tests would probably be valid for both males and females.

Question: Did you say our tests are validated against school performance?

Answer: Yes, school performance. It is difficult to design a test predictive of job performance, so normally we just look at school performance. That's the first hurdle you have to get over, but, in many cases, school performance can be predicted by your general I.Q. A verbal test and an arithmetic test together can be pretty good in predicting performance in most schools. Usually, a very low relationship is found between test scores and job performance.

Two studies of the job satisfaction of Navy women have been completed (Durning & Mumford, 1976; Durning, 1977). The first used data from the Navy's Human Resource Management Survey (HRMS), an organizational climate survey that is administered to all Navy commands on a periodic basis, usually about every 18 months. The data from this survey are maintained at NAVPERSRANDCEN. When the HRMS data were used to compare the responses of all men and women on shore duty, some gender differences were found. To begin with, women tend to respond more positively to management practices in the Navy than men do. However, as pay grade increases, women tend to become disproportionately disillusioned with some aspects of their organizational environment. This is particularly true for peer relationships. Figure 1 illustrates the results obtained from one of the four HRMS indices concerned with peer relationships. This pattern is typical of the other three indices. What you see in Figure 1 is that, when women come into the Navy, their perceptions of peer work facilitation are more positive than those of entering men. By the time women reach pay grade E-6, there seems to be a feeling of isolation from peers. On the other hand, the men apparently perceive increased peer solidarity.

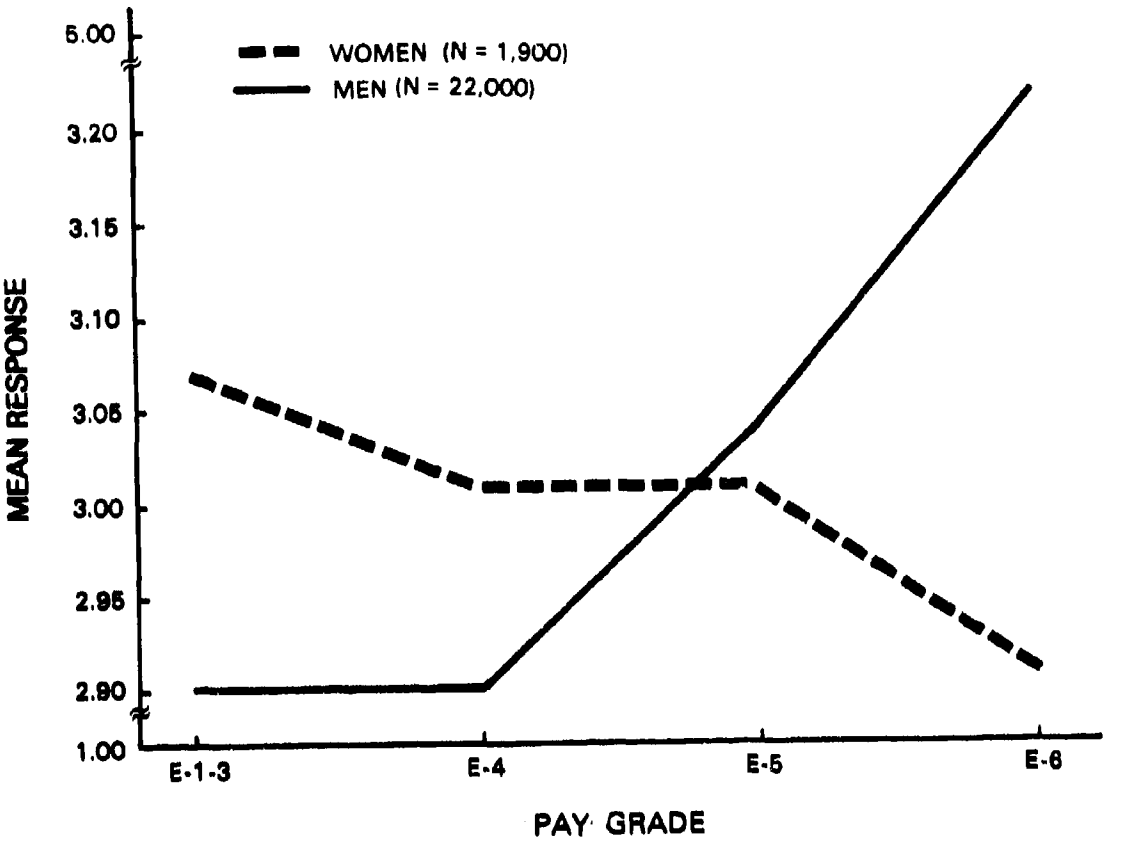

Figure 1. Peer work facilitation.

Question: These are different people in the different pay grades?

Answer: Correct, they are not the same people tracked longitudinally. This was a cross-sectional sample; that is, there were different people in the different pay grades.

Question: What does the HRMS mean by peers?

Answer: The question refers to one's work group, and is answered on a 5-point scale.

Queston: Does Figure 1 represent data from a great many different occupations?

Answer: Yes, but it doesn't include those on sea duty. All men on shore duty in the data bank were included in the male sample.

The women's perceptions concerning peer work facilitation can probably be explained by examining Figure 2. Notice that the percentage of women in the different pay grades in 1977 plummets precipitously after pay grade E-5. I would infer from this that women who were E-6s or above were usually or often working as the only female among a number of males. Further, I suspect that isolation led to the perception of poor peer work relationships.

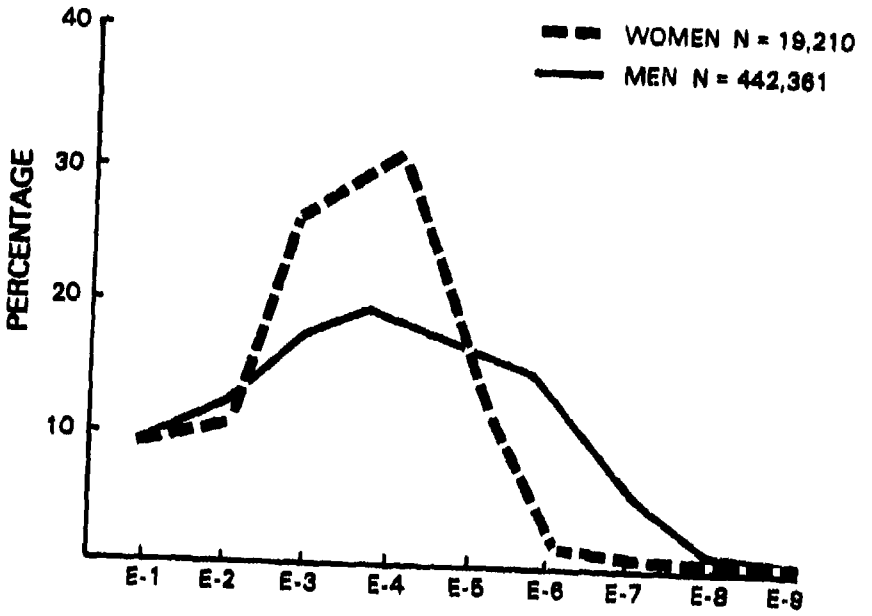

Figure 2. Distribution of women (N = 19,210) and men (N = 442,361) by pay grade (September 1977).

The hypothesis that women would experience better peer relationships when they had other females in their work group led us to conduct the second study (Durning, 1977). This study used survey data from women who were either in traditional or nontraditional (for women) Navy ratings, recognizing that women in nontraditional ratings will usually have fewer women in their workgroups. Table 5 shows some of the results obtained from this investigation.

The differences between the responses of women in traditional and nontraditional ratings are, perhaps, not as pronounced as one might expect, but women in nontraditional ratings did report more problems concerning: (1) male attitudes, (2) attitudes of co-workers' wives, and (3) resentment over being restricted to shore billets. A majority of the women in both traditional and nontraditional groups thought women should be allowed to go to sea and to serve on ships going into combat. Notice, however, that a majority of the women in nontraditional ratings were not satisfied with their progress in the Navy. Incidently, there were no differences between the responses of women in otherwise all-male workgroups and women having female peers.

Table 5

Attitudes of Women in Traditional and Nontraditional Ratings

Question	Women Responding "Yes"	
	Traditional Ratings (N=205) %	Nontraditional Ratings (N=77) %
Do male attitudes make your job difficult?	20	25
Do wives of co-workers resent you?	39	62
Do men resent you for taking their shore billets?	70	82
Should women be allowed to go to sea?	80	92
Should women serve on ships going into combat?	62	82
Are you satisfied with the progress you've made in the Navy?	70	49
Does your work give you feelings of self-worth?	57	68

Question: Was the question concerning women being allowed to go to sea a general question about women wanting to go to sea, or did it ask if "I" want to go to sea?

Answer: It is stated as a general question: "Should women be allowed to go to sea?" You seem to get very different answers when you ask, "Do you want to go to sea?"

We also gathered survey data from Navy wives and Navy women concerning their views on women in the Navy (Thomas & Durning, 1980). Table 6 shows some of the results from that survey. The results indicate that Navy wives and Navy women feel women should be allowed to work at any job for which they are capable. The most noteworthy result might be that 30 percent of the Navy women said they would leave the Navy if women were assigned to ships.

Table 6

Attitudes of Navy Wife and Navy Woman

Question	Percentage in Agreement	
	Wife (N=463)	Navy Woman (N=400)
Women should be allowed to work at any job for which they are capable	85	93
Most women cannot stand the stress of command	13	7
Women should not jeopardize male careers by competing for promotions	6	4
If women were assigned to ships I would (urge my husband to) get out of the Navy	12	30
I tend to be contemporary in my role affiliation	51	64

This study and other work we have done seem to indicate that wives don't care if their husbands are working with women, but they don't want them pulling liberty with Navy women. I think leisure time is a big factor--perhaps the key factor.

Question: Did you have a survey question about isolated duty stations?

Answer: We did have a survey item about isolated duty, and found that wives' resistance to Navy women being assigned to an unaccompanied tour or an isolated duty station was strong.

Question: Table 6 says that 30 percent of the women in the Navy do not want to go to sea in 1976-1977. Does this still hold true?

Answer: That is still the way it is. In the last survey we did, about 30 percent of the enlisted women and about 15 percent of the women officers did not want to go to sea. Of course, I don't know the percentage of men who don't want to go to sea.

The first women accepted for the Naval Academy entered in 1977. They were the first females to encroach on this very masculine, previously all-male environment. What about their academic grades? How did they perform under stress? The evidence thus far indicates that women do not perform as well as men during plebe summer where there is a high emphasis on physical skills. Their academic performance, however, is almost the same as that of the men (Durning, 1978).

A survey instrument was used to measure the beliefs of the men and women at the Naval Academy toward women's roles. It is called the Attitude Toward Women Scale (AWS), and was developed at the University of Texas. AWS scores obtained by midshipmen and members of comparison groups are shown in Table 7. There is a limitation that I want to warn you about; that is, the survey wasn't given at the same time

Table 7

Attitudes Toward Women Scale (AWS) Scores of
Midshipmen and Comparison Groups

Sample	Mean	
	Male	Female
Annapolis Plebes (1976)	41.7	54.5
West Point Plebes (1976)	42.3	57.4
Air Force Academy Plebes (1976)	42.1	54.0
University of Texas (1975)	47.2	53.2

at Annapolis as it was given elsewhere. It was found that the average AWS scores of academy men were about half a standard deviation below the average score of males at the University of Texas. The lowest score was 41.7 and the highest score was 57.4. The highest score possible on the AWS is 75. Low AWS scores indicate a traditional view of women's roles.

The research at Annapolis was designed to investigate if male attitudes would change as a function of the amount of contact with female midshipmen. We found, however, that degree of contact had no measurable effect upon attitudes. Along with the AWS, some specific questions about women's role in the Navy were asked. Table 8 shows the results from these additional questons. One half of the male midshipmen did not want to compete for promotion with women. They didn't have a very high estimation of how well women would perform in combat, and they would have preferred that the academy had remained all male.

Question: Are the data in Table 8 just from people in integrated companies?

Answer: No, the data are from the entire group.

Some additional survey information was gathered from women in their first year at the Naval Academy. These data, as shown in Table 9, indicate problems centered around publicity, negative attitudes of male peers, and male traditions. The fourth most frequently mentioned problem was concerned with academic standards--not physical standards.

Table 8

Attitudes Among Naval Academy Midshipmen

Question	Percentage in Agreement	
	Women (N=60)	Men (N=981)
Female and male officers should compete on equal basis for promotion.	85	51
Women officers should be assigned to sea duty and flying status.	97	43
Properly trained women would perform as well as men in combat.	83	37
The military should remain a masculine stronghold.	10	60
It is counterproductive to train women at Annapolis because they are prevented by law from serving on ships.	2	60
I would have preferred that the academy remain all male.	--	74

Table 9

Problems Experienced by Women in their First Year at the Naval Academy

Problem	Percentage
Object of publicity as member of the first integrated class.	67
Resentment or other negative attitudes of male peers.	67
Male traditions.	64
Academic standards.	55
Felt I had to prove myself.	48
Physical strength standards.	36
Emotional responses to stress.	29
Attitudes conveyed by important officers and/or authorities at the academy.	24
No senior women role models.	22
Too few other women as a support group.	12

We've only done one study on women officers--they tend to be an overlooked group (Thomas, 1978). Table 10 shows some results from a survey given to women naval officers in 1972 and 1977. There are some large differences in attitudes expressed over this time period. The responses from 1977 show the women to be even stronger (than in 1972) in their desire for equal opportunity, and more likely to believe they are being held back by Navy men. The table also indicates that, as of 1977, 87 percent of women line officers thought that special attention is required if sex discrimination is to be avoided.

Table 10

Women Officers' Perception of their Status

Question	Percentage in Agreement 1972	1977
1. Woman officers should be assigned to sea duty and flying status.	57	95
2. The Navy should consider a pilot program in which women serve on board large combatants (e.g., carriers).	63	89
3. Women officers are presently held back in their professional development because of ingrained beliefs held by men that women are not capable as managers.	67	75
4. Until women are truly integrated into the Navy, there will be need for attention from either the Bureau [BUPERS] or CNO level to preclude sex discrimination.	75	87
5. Opportunities for Navy women who wish to develop their potential are inadequate.	66	67
6. Women officers are not well accepted by Navy men.	37	55
7. It has been my experience that Navy seniors treat men and women officers as equal.	40	30

Researchers at NAVPERSRANDCEN have also examined whether male Navy recruits have stereotypic views regarding female roles (Wilcove & Thomas, 1979). A survey to measure the degree of acceptance of issues in contemporary society was administered to samples of recruits entering the Navy during 1975, 1976, and 1977. Table 11 displays some of the results that were obtained. We had expected to see a decline in sexual stereotyping of women by male recruits; however, the results plainly indicate a move in the opposite direction.

As I mentioned previously, NAVPERSRANDCEN conducted one study that concerned a very emotional issue--pregnancy (Olson & Stumpf, 1978). Some people in the Navy, as well as people in the other services, have suspected that young women may become pregnant in order to get out of their military obligations. In 1977, a letter was sent to the

Table 11

Sexual Stereotyping Among Male Navy Recruits

Item	Percentage in Agreement		
	1975 (N=849)	1976 (N=1163)	1977 (N=1000)
It is unfair to promote on the basis of sex.	82	71	70
Training women is often wasteful.	8	14	15
Women are out sick more than men.	15	22	24
Women have a time of the month when their emotions interfere with their jobs.	42	56	56
I would not want to fly in an airplane piloted by a woman	11	16	18

Chief of Naval Personnel by a master chief personnelman, complaining that pregnant women had a negative effect upon the morale in their work groups. The men in such work groups were said to resent the fact that women got time off for prenatal care, or because they didn't feel well before and after the delivery of the child, etc., and that this amounted to leave with pay. It was also argued that pregnant women were a burden on the work group because they were not able to perform their tasks. NAVPERSRANDCEN was tasked to determine whether pregnant women have a negative impact on morale and productivity and if Navy women lose more time than men. To answer the first two questions, interviews were conducted in aviation squadrons. To answer the third question, file data were obtained from the Navy Finance Center and from the Navy's Bureau of Medicine and Surgery (BuMed).

Table 12 displays some of the data obtained from the squadrons. The results from personnel in traditional and nontraditional ratings (for females) are shown separately because it was assumed that pregnant women in nontraditional ratings would have more difficulty performing normal tasks in the third trimester. Additionally, only people who had had a pregnant woman in their work group were interviewed. The results in Table 12 reveal that co-workers of pregnant women thought that pregnancy had no effect, or only a minor effect, on morale and productivity. Table 13 shows that many of the individuals in the sample did not know how leave for pregnancy was charged for pay purposes and, thus, could hardly resent the free time off.

Table 12

Opinions of Men in Traditional and Nontraditional Ratings About the Effect of Pregnancy on Their Workgroup

Item	Traditional Female Rating (N=33) %	Nontraditional Female Rating (N=21) %
What effect on morale?		
No effect	79	71
Slightly negative	21	24
Very negative	0	5
What effect on productivity?		
No effect	67	71
Minor	30	24
Major	3	5

Table 13

Awareness of Pregnancy Leave Policy

Group	N	Yes %	No %
Women	72	49	51
Male coworkers	20	25	75
Male supervisors	28	64	36
All men	48	48	52

Recall that the third question being investigated concerned time lost from duty, or "Who loses more time, men or women?" Table 14 shows the results of our analysis of the tapes obtained from the Finance Center and BuMed. The data are given in terms of "per 100 individuals per year." What is particularly noteworthy is that the reasons for absence vary markedly between the two groups. The major reason for absence of women is hospitalization. For men, it is unauthorized absence.

At NAVPERSRANDCEN, we hope to investigate several additional important issues concerning women in the Navy. Monitoring indicators of individual and organization effectiveness is one way of investigating the effect of increasing the representation of women. To do this monitoring, data files will be built using existing Navy data systems,

Table 14

Recorded Absences Per Year

	Number of Incidents Per 100		Number of Days Per 100	
	Women	Men	Women	Men
Convalescence[a]	6	1	108	25
Awaiting Physical Evaluation Board	--[b]	1	11	19
Hospitalization	28	11	277	142
Confinement	0	2	0	80
Unauthorized Absence/Desertion	2	15	26	437
Total	36	30	422	703

[a]Includes pregnancy-related absences.

[b]Less than 1 per 100.

such as the Status of Naval Forces Ratings, the Enlisted Master Record, and so on. A personnel accounting system that will track individuals through the Navy will be developed. These data will be used to provide inputs to our personnel inventory and flow models and to guide NAVPERSRANDCEN in making any changes needed in those important personnel models.

Another need is to look at the "new" Navy family. In addition to the traditional Navy family, in which only the husband has a career, there are now significant numbers of dual career and single parent families in the Navy. We suspect that these families have some real needs, and that the effectiveness of the Navy will be well served if steps are taken to identify and fulfill those needs.

The Navy's recruitment, selection, and assignment procedures should be examined, particularly for women. The Navy needs more women and men who are willing and able to enter certain occupational fields. Vocational interest measures could be developed to supplement the ASVAB and to help in the recruitment and assignment of male and female Navy recruits. Finally, research should be undertaken to identify the anthropometric and physical strength requirements of Navy equipment and jobs.

SOME HUMAN ENGINEERING STUDIES RELATED TO WOMEN IN THE MILITARY

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The research presented here addresses differences between males and females performing physical work. This is an area about which there is not much data available. What will be presented today are results from projects in progress at Texas Tech that relate to the topic of male-female differences. These involve projects for the Navy, Air Force, and the Public Health Service, all of whom are interested in male-female differences in the performance of physical tasks.

As in industry, more females are entering the military and are being placed on jobs that, in the past, had been assigned to men. Therefore, some important issues have been encountered:

1. Can females perform these jobs, and, if so, which jobs?
2. If some females cannot perform some jobs, can the military screen them out?
3. Can males perform the jobs?

The central question is how the available work force can best be used. If a job is found to be too demanding, it might be modified to make it easy to perform for both the male and female population. Engineers are not doing well in designing equipment, work places, or products from an ergonomics point of view. The way a lathe is designed today, the worker must stoop, bend, and extend to reach the controls. This does not conform to the philosophy of ergonomics, which states, "Fit the task to the Man." In order to operate a lathe as we know it today, the worker should be 4½ feet tall, 2 feet wide at the shoulders, and have an 8-foot span when the arms are spread. This individual does not exist.

Designing for both male and female populations is more difficult than designing for only one population. There are several examples that illustrate this. A male drives an automobile that has power steering and power brakes. However, if that automobile is driven by a female and the engine should fail, she may not be able to steer it or brake it. The reason is that many females could not apply a large enough force to turn the steering wheel or apply enough force on the brake pedal without the power assist.

Another example, which you see on a daily basis, is the meatgrinder. A meatgrinder that you can buy on the market may have an opening of 2½ inches. Most meatgrinders used in the home are operated by women. Looking at the female population, you will find that an opening of 2½ inches will accept as much as 87 percent of adult female hands. A 2-inch diameter opening will accept virtually no adult female hands. An error in design was made when the designer either did not look at these data or ignored them. Engineers must look at the design of the equipment, whether used by the military or civilian population, and the characteristics of the population that will interface with the equipment to ensure that the design is acceptable for that population. A study sponsored by the Navy to assess what has been published in the literature about male/female

differences in the performance of physical tasks was completed by Ayoub, Grasley, and Bethea (1978). In dealing with the design of physical tasks, anthropometric, biomechanical, and physiological variables are considered to be the most important classes of variables. A job may require size, strength, or stamina, or a combination of all three. From matrices developed by Ayoub et al., one is able to identify the literature available, the areas that have been studied, and the areas that have been neglected.

There is considerable overlap between the sexes on almost all variables. Concerning sex differences, generally women tend to be smaller and weaker, and to have less endurance. However, there are many females who are larger or stronger than some males. A female normally matures, regarding strength, at the age of 30, while the male normally matures at the age of 25. The decrease in this capacity with age is a function of many variables.

Many measurements that have been recorded on the female population, in terms of strength, find the average female's strength to be about 60-70 percent of the average male's strength. In some parts of the body, however, it can go as high as 80 percent of the male's strength. Finally, women would have performed about 50 percent as much work as men when fatigue sets in.

There are now more athletic programs for females than there were in the past; therefore, it is expected that the female 10 years from now will have significantly larger strength values than are found today. Female strengths will probably gain on those strengths of the male.

As I said, there is generally an increase in strength with increasing age until the age of 30 for females, and 25 for males. This relationship also holds true for many other parameters. Humans reach a maximum and then they start to decrease. For the female, the rate of decrease is usually slower than for the male. You cannot generalize some of these statements to every person because a woman may not be quite as strong as a man, but may have a higher physical work capacity. As a result, on a task that requires more endurance and less strength, that particular female could possibly perform better than the male. It is impossible to generalize and say, "On this physical task, we expect all males to be better than all females."

The Navy has sponsored studies regarding reach envelopes (see Figure 1) to (1) determine reach envelopes for males and females, (2) compare reach under restrained (using a harness) and unrestrained conditions, and (3) study the difference between male and female reach envelopes under both the restrained and unrestrained conditions (Ayoub & Halcomb, 1976; Asfour, Ayoub, Mital, & Bethea, 1978). Figure 1, which summarizes some reach envelope results, shows that, as an azimuth angle of 120° is approached, there appear to be distinct differences between males and females. Figures 2 through 5 show that the differences between restrained and unrestrained conditions become smaller at 120° azimuth. Yet, if you look at the lower azimuth angles, such as 45°, minus 30°, or minus 15°, the male-female differences start to disappear. Consequently, this type of data is useful for designs where both male and female populations will be used These data are being used in a study to provide anthropometric design parameters for a reclining cockpit seat to provide the pilot with additional protection during "high G" maneuvers. It will be demanding to develop such a seat to fit both males and females.

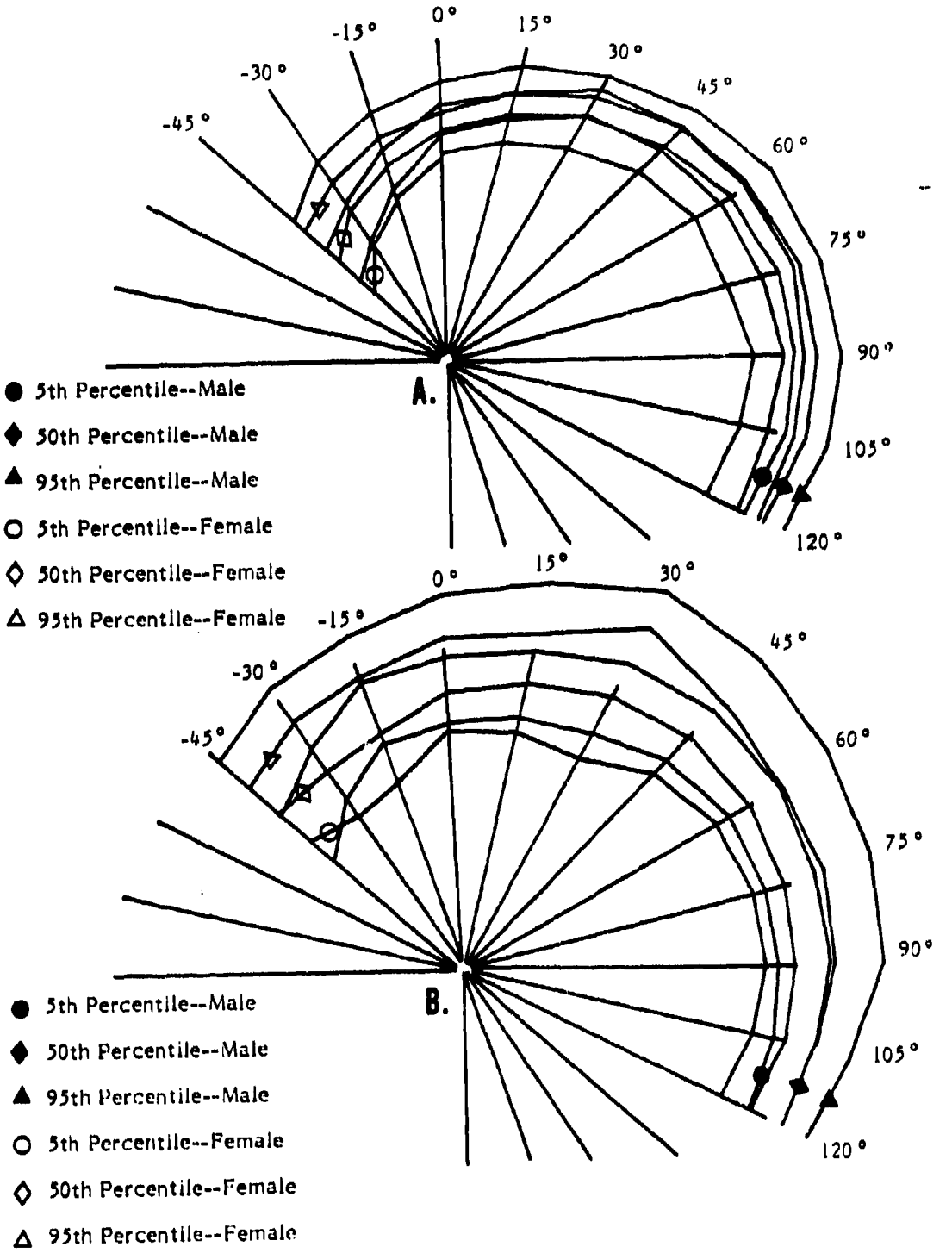


Figure 1. Reach envelopes for restrained (A) and unrestrained (B) male and female operators at 0 cm altitude above Seat Reference Point: 5th, 50th, and 95th percentile

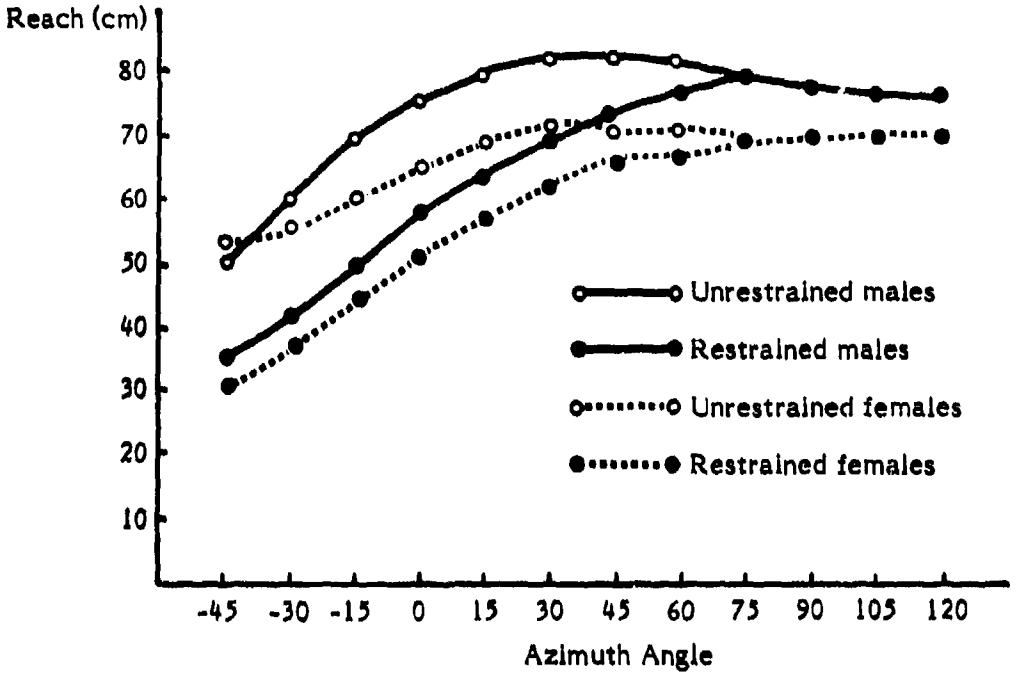


Figure ·. The reach of unrestrained and restrained males and females for different azimuth angles at 40 cm altitude.

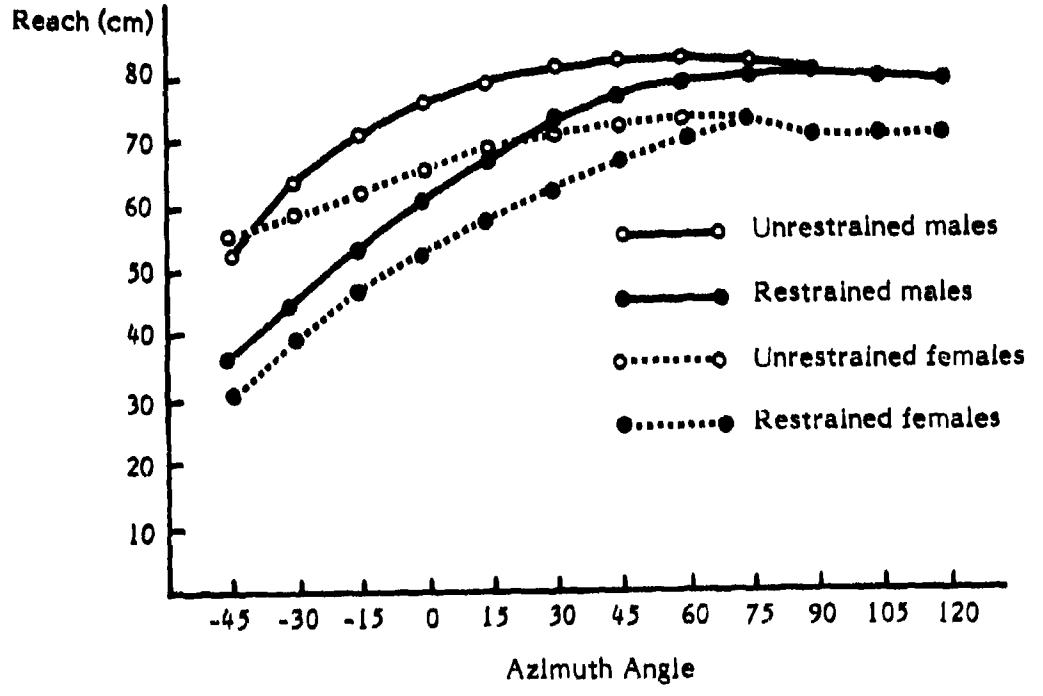


Figure 3. The reach of unrestrained and restrained males and females for different azimuth angles at 60 cm altitude.

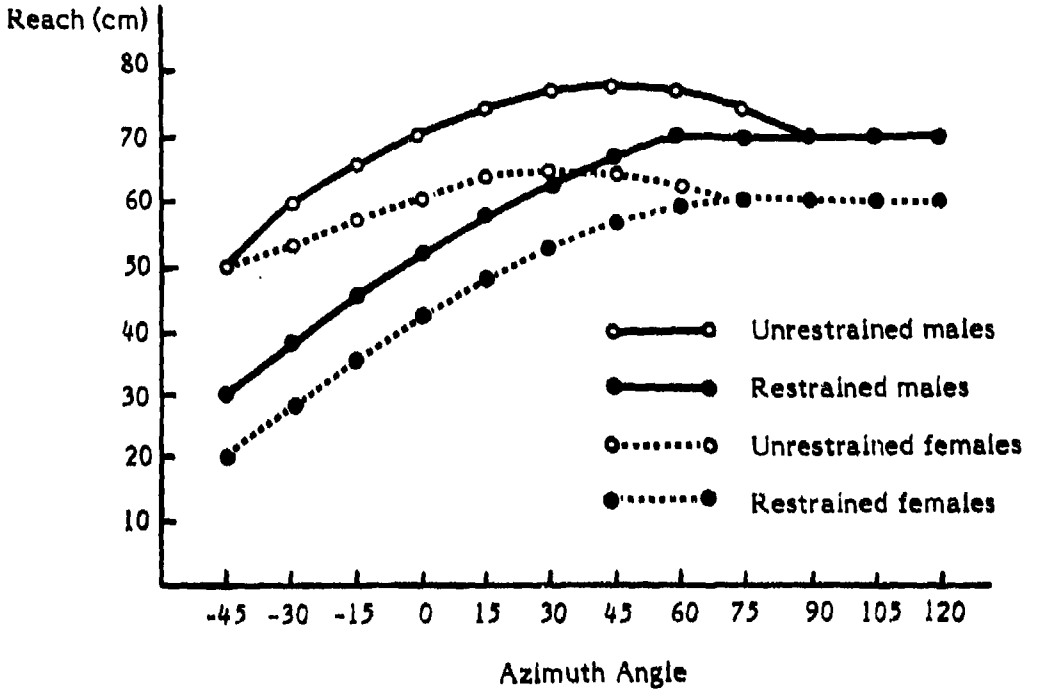
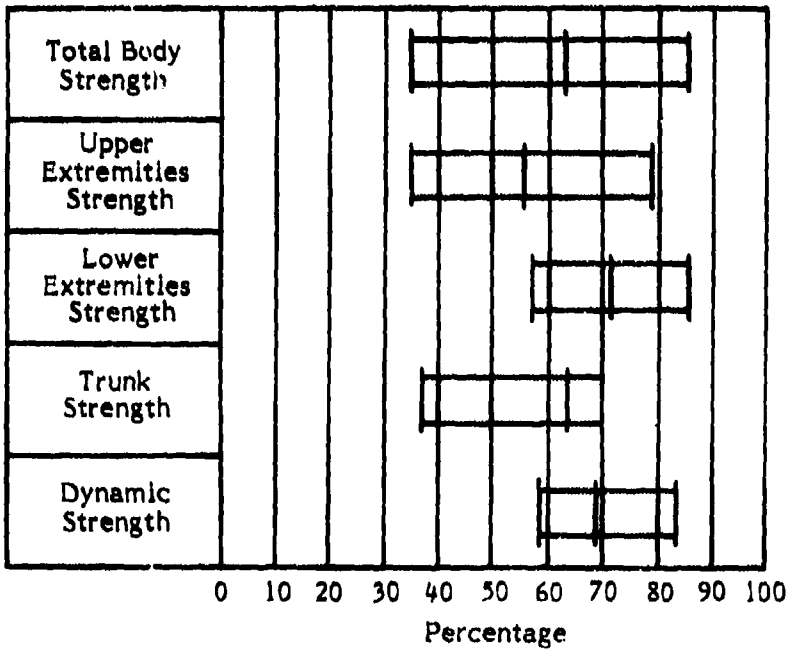


Figure 4. The reach of unrestrained and restrained males and females for different azimuth angles at 90 cm altitude.



Source: National Aeronautics and Space Administration (NASA), Anthropometric Source Book, Volume I: Anthropometry for Engineers. Yellow Springs, OH: Webb Associates, 1973, p. VII-50.

Figure 5. The range and average mean percentage of women's strength as compared to men's average strength. (100% = men's average strength)

In an M.S. thesis written at the Air Force Institute of Technology (AFIT) on hand tools used by females in the Air Force, the author reported that the females have had difficulties with some of those tools (Albeit & Schaefer, 1977). In a study at Texas Tech concerning hand tool sizes, plier span was investigated (Ayoub, 1976). If a pen is held in the hand and is gripped as hard as possible, it can easily be pulled out of the hand because of its size. If, on the other hand, a cylinder of 1½ inches in diameter is held, it would be quite difficult to remove. Grip strength is a function of the size of the objects you hold and the size of the hand. Therefore, if tools are designed for male hands, it may be difficult for females to use the same tools.

Similarly, with more females entering the Air Force, problems of physical demands of task become more apparent. Consequently, there is an interest within the Air Force to design jobs to be performed by males as well as females and also to establish a method, if needed, to assign individuals to physically demanding tasks. If these tasks cannot be reduced in demands, the Air Force would design a test battery to administer to enlistees prior to assignments to AFSCs that are physically demanding. These placement decisions should be made prior to assignment to technical schools. Not only should aptitudes be tested, but it should be determined whether an individual is physically able to perform all the physical activities required by a particular occupation.

Job demands should be emphasized to find out what human capacities are required to perform a given job. If this is done, then a better chance exists to redesign jobs as necessary to reduce the jobs' demands so that a greater percentage of males and females can perform them. Hopefully, the capacities of males and females will be studied and more will be learned about the physical capabilities and limitations of both sexes. The Air Force is sponsoring research to develop methods for screening individuals (Ayoub, Powers, Bethea, Lambert, Martz, & Bakken, 1978). The project's first major phase is concerned with measuring job demands. After the job requirements have been quantified, they will be translated into human capacity requirements. Finally, a test battery will be developed to measure these relevant capacities.

Many demanding jobs in the Air Force require manual handling activity. The person lifts an object, carries an object, lowers an object, or pushes or pulls an object. These are the types of activities that have been considered demanding by many airmen. The basic phases in the project are: (1) analyze the job, find out what the job demands are, and quantify them, (2) translate those demands into what capacities we need in terms of size, strength, and stamina, (3) design tasks to measure these capacities, and (4) assign people to these jobs and follow through to validate the test battery.

In a major study for the Public Health Service, the lifting capacity among the industrial population in both males and females has been studied (Ayoub, Bethea, Davanayagam, Asfour, Bakken, Liles, Mital, & Sherif, 1978). Lifting capacity was defined as the maximum acceptable weight of lift for a frequency of one lift per minute, knowing that as you increase the frequency of lift the capacity decreases. This is just one variable among many task variables that could affect lifting capacity. Three other major task variables that influence lift capacity were considered: box size, frequency of lift, and height of lift. Individual difference variables, such as height, age, strength, anthropometry, and coordination are among many individual variables that influence the ability of lift. There are also many environmental variables that affect the ability to handle material. These include hot or cold environments, the type of floors that affect traction, the stability of the floor, and pitching of ships while on-board operations are being performed. It would be extremely difficult to study, in a single experiment, all combinations of these variables, their interactions, and their effects on lifting capacity.

At Texas Tech, a team is updating and developing a list of lifting capacity data for industrial workers and is developing a new lifting capacity prediction model. The

prediction model will allow the user to make measurements on an individual and estimate his or her lifting capacity.

One phase of this work sponsored by the Public Health Service is extremely important. In this phase, the relationship between demands and individual lifting capacity on injuries is being studied. This is being accomplished by using the Job Severity Index (JSI), which is the ratio between the job's demand and the individual's capacity. This ratio describes and quantifies the physical stress of the job. As demands of the task exceed the capacity of the individual, the probability of injury increases. If job demands are very low in relation to the person's capacity, the injury probability would be considerably smaller. Operator variables are used to estimate individual capacity.

In generating population capacity data, box sizes (12, 18, and 24 inches long), frequency of lift (1, 2, 4, 6, and 8 lifts per minute), and heights (floor to knuckle, floor to shoulder, floor to reach, knuckle to shoulder, knuckle to reach, and shoulder to reach) were considered. A controlled environment was used to reduce the scope of the experiment to a manageable size.

The only dependent variable of interest was the maximum acceptable weight of lift, which was measured using a modified psychophysical procedure. Both male and female subjects lifted a box with weights inside it. The subject was free to take weights out of the box or to put weights into the box until he/she thought the weight was one that he/she could lift repeatedly under prescribed conditions of frequency, height of lift, and box size for a long period of time without getting fatigued. Subjects arrived at their maximum acceptable weight by using his or her own style of lifting.

Tables 1 and 2 show the results of experiments on lifting capacity. These data give results adjusted for one lift per minute for males and females, because the capacity to lift is defined as the maximum acceptable weight of lift. To obtain a male vs female strength percentage, compare the averages in Table 1. The ratio, or percentage of female to male strength, is usually about two-thirds. The data in Figure 5 give further support to the notion that the average female's strength is about two-thirds that of the average male on many different strength measures.

To predict lifting capacity of an individual, a number of variables were measured: (1) arm and back strength, (2) shoulder height and abdominal depth, (3) composite strength, where the subject pulls up on a handle with the knees bent, the back flexed, and the arms straight (this combination of leg lift and use of the arms is defined as the composite static strength), and (4) dynamic endurance, defined as the number of times the subject can move (flexion/extension at the elbow) a weight on his arms equal to 20 percent of the subject's maximum static arm strength to the same position at a preset cadence. The subject's sex and age were recorded for use as predictors.

Using the capacity data for each subject coupled with strength, size, and endurance data, regression models to predict this capacity were developed. Figure 6 shows a prediction model and its fit of the data for the floor to knuckle height lift.

Question: I understand the Air Force uses an X-Factor test. Can you tell us about that test?

Table 1

Mean and Standard Deviation of the Maximum Weight (Lbs.)
Acceptable to Male and Female Industrial Workers
for Different Frequencies (Lifts/Min.)

Height of Lift	Sex	1 Lift/Min.		2 Lifts/Min.		4 Lifts/Min.		6 Lifts/Min.		8 Lifts/Min.	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Floor to knuckle	Male	61.17	16.86	59.71	18.40	56.79	16.62	55.14	15.50	52.30	17.01
	Female	37.12	6.76	29.93	5.64	32.20	8.23	28.92	6.60	30.44	5.97
Floor to shoulder	Male	51.21	12.11	50.05	10.43	47.73	11.47	47.00	11.76	44.25	13.87
	Female	31.08	6.54	29.68	6.50	26.87	5.97	26.48	7.52	26.02	5.79
Floor to reach	Male	49.12	11.20	47.52	12.85	44.31	12.45	42.91	8.44	36.08	8.79
	Female	28.14	5.41	27.21	5.11	25.35	6.17	23.86	5.38	23.52	4.05
Knuckle to shoulder	Male	57.75	14.67	55.60	13.98	51.86	15.15	51.67	15.28	48.09	13.90
	Female	31.97	6.55	30.22	7.24	26.71	5.23	29.63	5.25	24.73	6.64
Knuckle to reach	Male	53.54	10.70	50.45	12.00	44.27	8.85	41.82	8.47	38.55	8.68
	Female	26.22	4.86	26.00	5.54	25.55	5.11	26.05	3.89	24.11	5.06
Shoulder to reach	Male	43.62	10.45	43.15	9.55	42.20	10.51	39.26	11.37	35.60	9.33
	Female	25.78	4.17	24.72	4.64	22.59	3.70	23.22	3.17	23.51	5.19

Table 2

Mean and Standard Deviation of the Maximum Weight (Lbs.)
Acceptable to Male and Female Industrial Workers
for Different Box Sizes

Height of Lift	Sex	12-inch Box Size		18-inch Box Size		24-inch Box Size	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
Floor to knuckle	Male	60.40	17.45	56.96	16.50	50.70	15.59
	Female	32.04	6.53	30.62	7.85	28.16	4.92
Floor to shoulder	Male	46.35	13.26	48.87	11.68	45.24	11.25
	Female	29.05	5.70	28.28	7.22	25.42	6.18
Floor to reach	Male	45.24	10.30	41.39	12.99	40.61	9.71
	Female	26.17	5.17	24.86	4.73	24.40	6.05
Knuckle to shoulder	Male	53.06	12.28	52.40	14.66	49.64	16.86
	Female	28.51	7.06	27.83	6.50	27.06	6.23
Knuckle to reach	Male	42.81	11.39	45.94	11.19	43.34	9.47
	Female	25.61	6.12	25.38	3.76	25.56	4.78
Shoulder to reach	Male	39.37	10.56	39.33	11.02	40.86	9.93
	Female	25.00	4.50	22.90	3.84	22.53	3.83

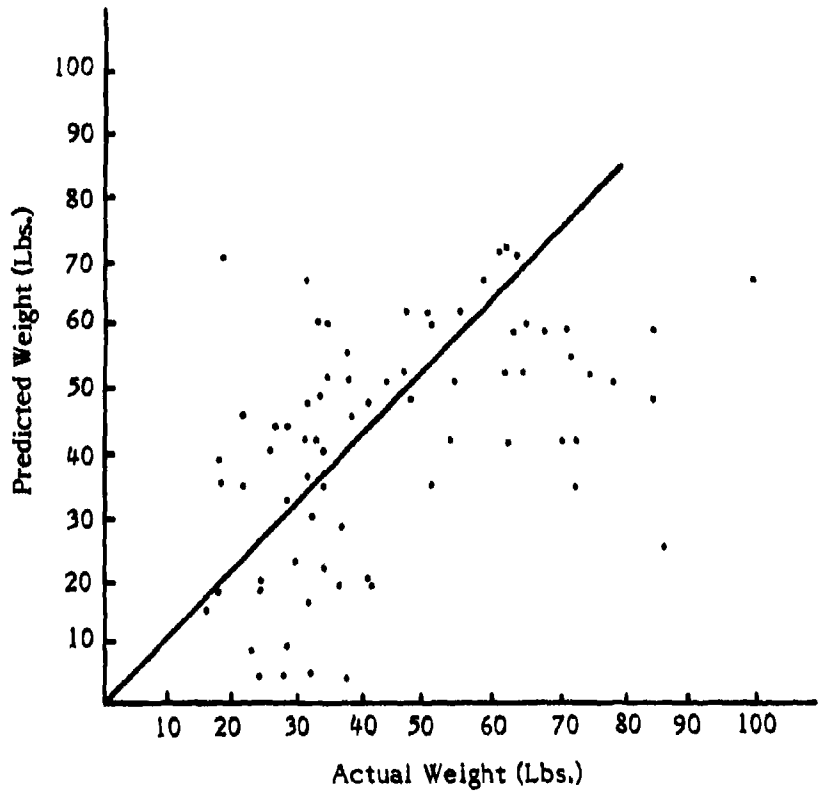


Figure 6. Model performance for the floor to knuckle height (males and females).

Answer: An X-factor test is used by the Air Force at the entry stations. At this time, the enlistees are assigned an X-factor value: X-1, X-2, or X-3. An X-1 AFSC is the most physically demanding AFSC, and an X-3 AFSC is the least physically demanding. During the processing of the enlisted personnel at the Armed Forces Entrance and Examination Station (AFEES), they take what is called an X-factor test. To be classified X-1, a person must lift 70 pounds 6 feet. To be classified X-2, the person must lift 40 pounds 5 feet. The problem is that these tests were not developed with AFSC task requirements taken into consideration. As a result, the test really does not predict the success or failure of these personnel, if assigned to a particular AFSC. This is why the Air Force needs to study these jobs, and to have a physical test battery that is valid. They would also like a test battery that does not require more than 15 minutes to administer. The AFEEs schedule is tight and, of course, you do not want each enlistee to spend too much time performing tests. Hopefully, a test battery that takes about 15 minutes can be developed.

Preliminary tests show that about 99 percent of the males and 28 percent of the females passed the X-1 test. The fact that 99 percent of the males pass X-1 is a problem because it shows that the test is not discriminating enough.

Question: Could you summarize the state of knowledge concerning the physical requirements of military jobs?

Answer: The state of knowledge is poor. Since only a very few people active in this area have started to analyze physical requirements of jobs, the data currently available are inadequate. I believe the way we have studied lifting suggests a useful approach; that is, to study the job demands while studying human capacities and find out from the job demands what human capacities are required to succeed on the job. Additionally, we can always determine, once we have decided to study the job demands, what we can do to reduce them so that they stay within the capacities of a large percent of the work force available. There are demands that we cannot change, such as the carrying of wounded individuals, in which case individuals must be carefully screened before assignment to these jobs.

Methodologies to translate job demands to human capacities are still crude and require refinement. Once we know the capacities, we must design tests to measure them using standard tests or special tests. Therefore, we may design our own tests or go back to the jobs and work sites and identify key elements of those jobs using the key elements as our tests.

Of the 320 AFSCs, about 42 are X-1, 190 X-2, and the rest are X-3. Those numbers aren't necessarily true, because the X-factor is not a very useful tool, as previously stated. The Air Force, and possibly other military services, also have problems as personnel are transferred from one command to another. At a training base, for example, the tasks involved in servicing aircraft may not be as physically demanding as those involved in servicing aircraft at Strategic Air Command (SAC) or Military Airlift Command (MAC) bases. It may be categorized as the same job but, in fact, the physical demands may be quite different.

PHYSICAL REQUIREMENTS OF NAVY JOBS

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The requirement to develop physical strength standards for Navy jobs has been emphasized by the increased use of women in the military services. The work that I will describe comes from a project begun at NAVPERSRANDCEN in late 1977. The other services have been busy at these kinds of studies for some years. The Navy was a little late in getting into this sort of research, but I think we are catching up.

A lot of research has been done on some aspects of occupational strength requirements. Many reports have been published on the large strength differences between men and women. A very fine survey of the literature, which an Air Force contractor did a few years ago, reviewed knowledge concerning "static" and "dynamic" strength (Laubach, 1976). Static strength is the application of force with no movement, and dynamic strength is the application of force with some movement. The term dynamic is used in two different contexts. Since one involves moving the body only, some dynamic measures involve what we typically call calisthenics--performance on sit-ups, pull-ups, push-ups--where there is only the movement of the body. The second kind of dynamic measure involves the movement of the body to move some external object.

In the Air Force review of the literature, it was found that, on static measures involving the upper torso, the average scores of women were about 60 percent of those of men. On measures involving the lower torso, however, the average scores of women were about 72 percent of those of men. In measures involving both the upper and lower torsos, the average score of women is about 69 percent of that of men.

Unfortunately, I found very little in the way of reports that I would consider really helpful to the work we are doing. There are a few exceptions. There has been some very good work done on job analysis and on the development of measures simulating the strength requirements of firefighting jobs (Ayoub & McDaniel, 1973; Brown, 1972; Davis, 1976; Kroemer, 1969; Lemon, 1977). Also, a few years ago, AT&T conducted and extensive study to validate a set of tests for a job they call outside installer-repairer technician--all the people who climb the poles (Tenopyr, 1977). AT&T worked on that for 2 years for one specific job. By comparison, the Navy wants physical standards for some 80 Navy ratings and some 1000 or so Navy Enlisted Classification Codes (NECs) (job specialties) and general shipboard tasks, and they want them soon. The AT&T study was well done. It validated a set of tests to predict performance in the job being studied.

There are two sides to the work we are doing for the Navy: the predictor side and the criterion side. The predictor side involves development of some sort of standard physical test battery. The criterion side is the more difficult, involving the development of objective measures of the human forces required on the job. Later, I will tell you some of the approaches we are taking to do that. On the predictor side, we have three static measures, four dynamic measures, and six anthropometric and skinfold tests. We were helped in this work by an Office of Naval Research funded project of the late 50s and early 60s by Dr. Ed Fleishman. In 1964, he published a book as a result of his studies on the structure of physical fitness, a book that I believe is still a classic. Using factor analytic techniques, he identified nine basic factors of physical fitness. We selected for

investigation in our standard test battery some physical tests that he identified as measuring those factors. The problems that we are addressing in our research, and the approaches we are taking are listed below:

1. Problem Elements

   a. Without strength standards, personnel might be assigned to jobs they could not fully perform, or to those where they could be injured from exceeding their capabilities.

   b. There are differences between the technical (rating/NEC) and military task requirements of some jobs.

   c. Testing is made difficult because of the relatively few women in nontraditional and shipboard jobs.

2. Approach

   a. Identify the most muscularly-demanding tasks of each rating/NEC, shipboard evolution, and ship/station general duty (criterion tasks).

   b. Objectively measure the human force requirements of each criterion task, and develop task simulators for administration to men and women recruits.

   c. Develop a standard strength test battery (STB) that can be quickly and simply administered to applicants, and validate it on the criterion tasks.

   d. Specify strength standards in terms of the STB scores.

Question: Have you been developing a strength test? Would you intend to administer the tests to potential recruits, or to personnel after basic training?

Answer: The intended use is for potential recruits. When the test battery is validated, it will be implemented at the AFEES with a follow-up test at the Recruit Training Center (RTC). I will be showing you the results of the pre- and post-recruit training administration of these tests, which addresses your other question.

Question: How do you set physical strength standards for a radioman, whose strength requirement is nil? The radioman would be used, however, in some evolutions that require strength, such as damage control and firefighting.

Answer: We are identifying not only job-specific tasks, but also the military and general tasks associated with shipboard duties and shore duty.

The initial administration of the STB to recruits was at Orlando because that is where the Navy's women recruits are training. Last spring, the pretests were administered on Day 1-1 (the first day of the first week of training). In fact, some of the male recruits had just stepped off the bus arriving at the training center. The final test (the posttest) was administered 2 days before recruit graduation. It would be nice to have administered these tests under the same conditions, but that was not possible. The pretests were administered in early spring about 6:00 a.m. in the gym, which was comfortably cool. The posttests were administered in late spring in the afternoon, when the inside temperature of the gym was 85-87 degrees, and the relative humidity was very high. We have no way of knowing the extent to which these different conditions affected the results until we do additional testing.

Question: Did you have two separate hand-grip strength dynamometers? I'm thinking that women should be tested with a smaller grip distance than men.

Answer: The grip distance issue is admittedly difficult to resolve. On the one hand, the human factors people say you cannot use different grip sizes because you are not going to have different sized tools for every human being using them. On the other hand, if I used constant grip distance, then I would be criticized by the equal opportunity people saying, "Hey, that's unfair to the women." What I did was let each subject adjust the grip distance to maximum advantage--maximum strength for the handsize of the subject.

Question: Why did you include tests mostly of upper torso strength in your test battery?

Answer: One reason, which I have already mentioned to you, is that the greatest differences in strength between men and women are in the upper torso. Second, from our initial observations and surveys, it appears that most Navy jobs utilize upper torso muscles and body components more than they do the lower torso muscles. Of course, the Army and Marine Corps have a different problem; they have a major concern for hiking, carrying things long distances, and running. A third reason is that the legal staffs of the various services have already emphasized the importance of avoiding any tests at the recruiting stations that would incur liability to the services for injuries. Their particular concern is to avoid hernia and cardiac-type injuries. We would have a much greater probability of incurring these kinds of injuries with lower torso tests than we do with upper torso tests.

Question: You know they would have to be able to carry their own weight. In addition, I would think you would want to determine if they can move an object of known weight.

Answer: Well, that is the purpose of the criterion task measure. However, for the reasons I mentioned earlier (safety, etc.), we did not use external objects in the predictor test battery because we wanted to avoid use of the lower torso.

Question: What is an ergometer?

Answer: It is a device to which you can attach pedals for foot or hand operation and on which you can set a resistance level. Performance on it can be scored in various ways. One way would be to establish resistance, and determine how long the subject could crank against the resistance. The way we used it was to set in a constant resistance and instruct the subject to crank as rapidly as possible for 30 seconds. That looks pretty easy, and it feels pretty easy for the first 5 seconds. However, by the time you get to 20 seconds, you feel like you have been paralyzed.

Question: Could you explain the skinfold caliper and the component of body weight?

Answer: The skinfold caliper was applied at four body sites: the triceps, subscapula, abdomen, and thigh. The caliper points open such that there is a constant area of application and a constant pressure loaded on the caliper points. You simply measure, under constant area and constant pressure, the width of the fold of skin between the caliper points. The greater the width, the more fatty-type tissue there is on the subject. We used these results primarily for calculating the separate components of fat body weight and lean body weight. There are important sex differences to be considered in

such measurements. We used only the abdominal site and regression-derived statistical weight for calculating the men's fat body weight. We used the other three sites--the triceps, subscapula, and thigh--to calculate the women's fat body weight.

Question: I thought a subject had to be immersed in water in order to estimate fat and lean body weights.

Answer: That method, called the hydrostatic technique, is one of the most accurate methods, but it is terribly time-consuming and very, very expensive. What we did was use skinfold estimates because, from the literature, we found they validated best for people the age of Navy recruits. Incidentally, these estimates from skinfold tests had been validated against measures taken using the hydrostatic technique.

Figure 1 shows the data obtained from the pretest administered on Day 1-1 and from the posttest administered at the end of training. The dotted line is the average women's score and the solid line is the average men's score. The percentage is the percentage change from pretest to posttest. For example, for the hand-grip measure, there was a 1 percent increase in hand-grip strength for women and a 2 percent increase for men from pretest to posttest. Looking at some of the results, we see that on the one-arm pull, there was a 6 percent increase in scores for the men and a 17 percent increase for the women. On the two-arm lift, there was a slight decrease for the men and no change for the women. On the ergometer, there was a moderate increase for the women and a fairly substantial increase for the men.

We were interested in looking at these findings as they related to what is presently done in the physical conditioning program at the recruit training centers. They do have sit-ups and push-ups, but they don't have pull-ups or anything that involves the actual exercise of hand grip. Thus, we predicted that there would be improvement in the tests that related to RTC conditioning-type activities, and little change in the others. Our predictions were fairly accurate.

On the one-arm pull and the ergometer, we think the improvement may be due to swimming done during RTC training. The results of the two-arm lift, where there is no change for women and a loss for men, suggest that some people may have been in better condition prior to RTC than they were after they completed recruit training. On the dynamic measures, you can see substantial increases in the number of sit-ups and push-ups, which relate directly to two of the RTC conditioning activities. On the pull-ups, however, there was little change and, in fact, a drop in the case of women. You will notice about a .30 score for women on pull-ups, which corresponds with findings from the Fleishman study I mentioned earlier. He had nationally-sampled groups of men and women of the age of our recruits in his studies done in the late 1950s and early 1960s. He found that 75 percent of his women could do no pull-ups, or only one. For that reason, we modified our bent-arm procedure from Fleishman's, because he required the subject to pull up to a hanging position. We modified the procedure so the subject was assisted to a starting position--chin at her hand level. Fortunately, our stop watches were calibrated in 1/100ths of a seocnd, because we had some scores of 1/10th of a second.

Question: How was the sit-up test administered? Did you record the maximum number completed with no time limit?

Answer: For the sit-up test, the score was the maximum number in 30 seconds; for the push-up and pull-up tests, the maximum number in 3 minutes.

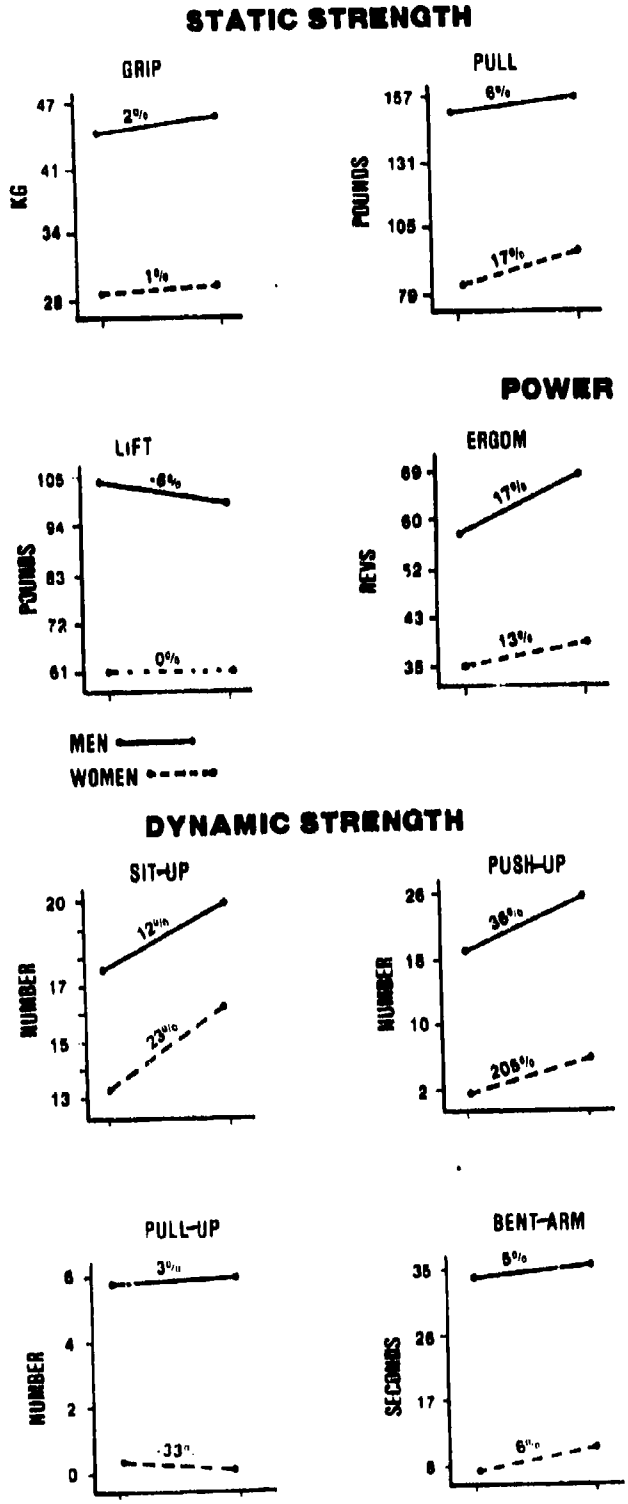


Figure 1. Percent change between pre- and posttests for men and women.

We also analyzed separately the progress of the high- and low-scoring recruits. We took the pretest scores, rank-ordered them, and formed equal-sized subgroups of high-, middle-, and low-scoring individuals. This allowed us to examine the change in the subgroups' scores. Figures 2 and 3 display these findings. You will notice in Figure 2 (and this is a common finding in the physical conditioning and physical training literature) that, for example, on the sit-ups, the highest group had minimal improvement and the lowest group had the most substantial improvement. On the bent-arm hand and two-arm lift, there were declines in performance by both the top men and the top women. These changes within the subgroups have not yet been adjusted for the effect of regression towards the mean, but this effect is expected to be minimal, because the tests are quite reliable and posttest variances were smaller.

There was virtually no change in the total group on the fat/lean ratio but, as you can see in Figure 3, there were large changes in the subgroups. The RTC program does tend to thin down the fat ones and fatten up the skinny ones. Figure 3 also shows the ratio of weight to height. Within the past year, height and weight have been added to some of the Navy enlisted performance evaluation forms. The results shown in Figure 3 demonstrate how poor a measure the weight/height ratio is compared to measures of the fat and lean body weights. As you can see, there are shallow curves for the weight/height ratios and you really can't tell much from that ratio. We also examined correlations among the various measures of body weight and performances on the strength tests that we had administered. These correlations are shown in Figure 4.

One of our interests is to examine enlistment and reenlistment weight standards in the context of task performance capability. Notice that all three of the static measures (hand grip, one-arm pull, and two-arm lift) correlate positively with fat body weight, but, as you would expect, these various measures of weight correlate very negatively with the dynamic strength measures. The fatter the persons are, the more difficult it is for them to move their own body weight. Of considerable interest to us are the correlates of performance on the ergometer, because it is our best approximation or simulation of many Navy tasks until we get the actual on-site measures. The ergometer measures forces similar to those necessary for tightening or untightening a watertight door, cranking something on a gun director mount, or cranking something on an emergency steering control. Thus, we were particularly interested in the ergometer as a measure of upper torso work output. It is interesting that the correlations of fat body weight with ergometer performance are almost as high as the correlations of the other body measures with ergometer performance. This would suggest that heavier people--specifically the fatter people--are more capable of upper torso work than are lighter people. Notice that the results for men and women are very similar. I have compared our data with results from some of the better studies I have found in the literature--studies in which there was a simulation of actual job tasks. For example, Snook and Ciriello (1974) compared the abilities of industrial men, industrial women, and housewives in a production-type task of lifting weighted objects from the ground level up to something like waist level. They did it the same way they would in a production task, in 40-minute periods for 8 hours a day, day after day. It is one of the finest studies that I have seen in simulating the realities of that kind of work. Table 1 shows some of the results of that study, and compares subjects with Orlando RTC recruits who have completed training. The authors of the study raised the question of why industrial women did better at the physical tasks than did the housewives. They asked, "Is it because they are in industry or is it because they chose to do that kind of work?" If you look at the difference in body weight between industrial women and housewives, and review what is shown in Figure 4, it seems to me that you could account for most of the variance in physical performance with the differences in average body weight.

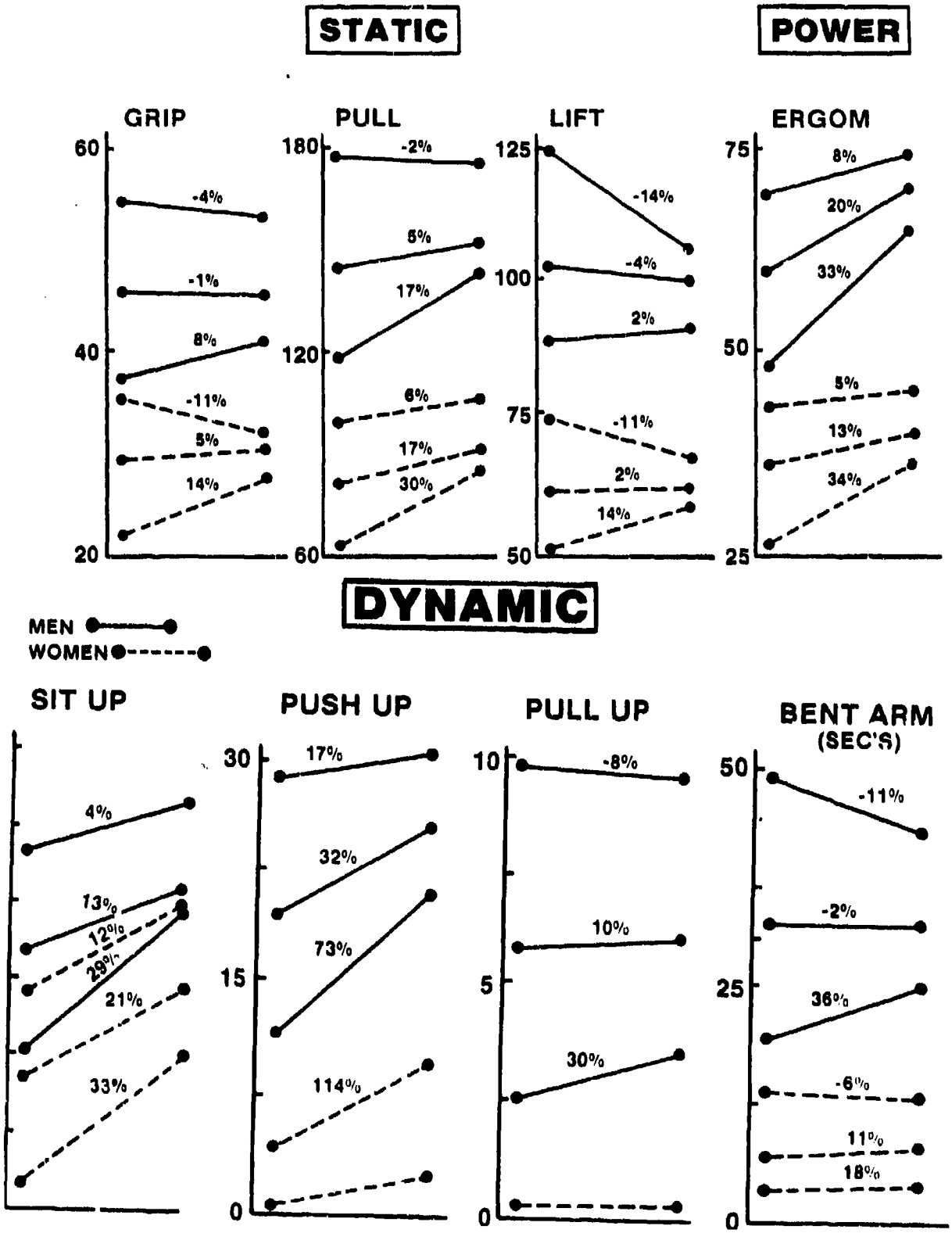


Figure 2. Differences in pre- and posttest scores--high, middle, and low scores.

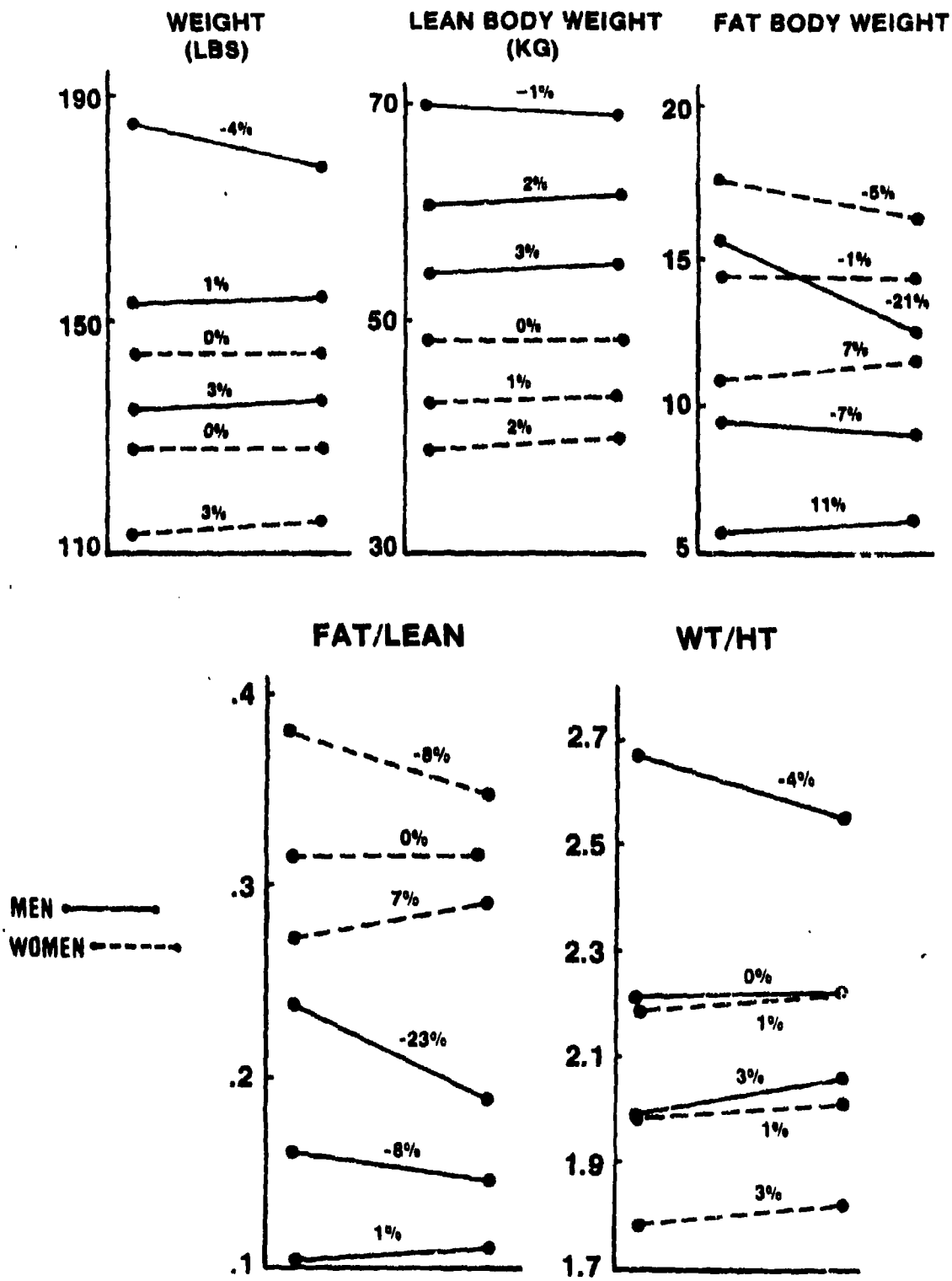


Figure 3. Weight changes between pre- and posttest--high, middle, and low scores.

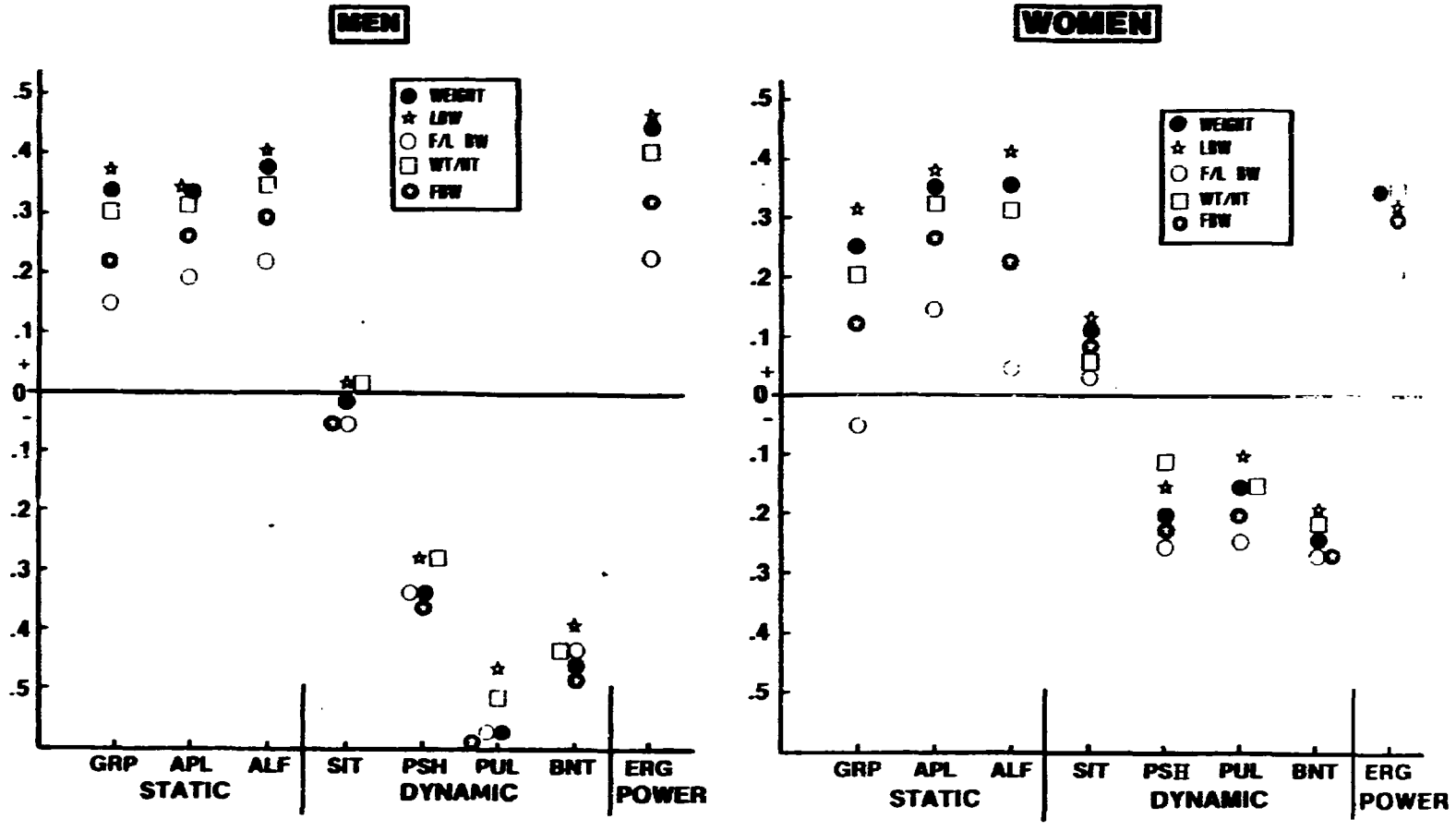


Figure 4. Weight correlations for men and women—pretest.

Table 1

Weight Loads and Body Weight

Item	Industrial Men	Industrial Women	Housewives	Recruits Men	Recruits Women
Sample Size (N)	28	15	16	195	263
Age (yrs.)	40	39	36	20	21
Weight (Lbs.)	164	144	128	156	130
Grip (KG)	52	31	29	46	29
Low Lift (Lbs.)	54	37	21		
Pull (Lbs.)					
Initial	70	59	45	--	--
7'--Sustain	48	43	30	--	--
Push (Lbs.)					
Initial	80	61	46	--	--
7'--Sustain	48	42	27	--	--
100'--Sustain	31	26	20	--	--
2-Arm Lift (Lbs.)	--	--	--	100	61
1-Arm Pull (Lbs.)	--	--	--	157	93

The data in Table 1 also appear to indicate a possible sex difference in the proportion of body weight that can be repetitively lifted. Notice that the low lift (in pounds) was about one-third of the men's body weight compared to about one-sixth to one-third for women. Table 1 also provides data on pounds of push that could be exerted. The pushes range from a nearly static, initial push, to a 100-foot sustained push.

One of the issues that we are raising concerns the question of whether the present physical conditioning is appropriate in the Navy's recruit training program. In the context of preparation for lifting tasks, one of the better studies was done by Wilmore (1974). He demonstrated that, for both men and women, a relatively brief conditioning program and weight training, consisting of two 40-minute periods per week for 10 weeks, yielded very impressive strength gains. Table 2, which provides some of Wilmore's results, shows that, for men, there was a 26 percent increase in the leg press, 19 percent increase in the curl, (the curl is one of the upper torso strength measures of particular interest to us), and a substantial increase in the bench press. Women scored substantial increases also--30, 11, and 29 percent in the leg press, curl, and bench press, respectively.

The data in Table 2 also show that the exercises didn't make the women look like gorillas. The changes in the various girth measurements for women were quite minor; thus, the exercise had no "masculinizing" effect.

Table 2

Results from 10-week Weight Training--Two 40-minute Periods Per Week

Item	Men (N = 26, Age = 20.3) Pre	Post	%Δ	Women (N = 47, Age = 20.3) Pre	Post	%Δ
Weight (Lbs.)	160.8	161.4	0.4	127.8	127.6	-0.2
LBW (Lbs.)	138.8	141.5	1.9*	96.1	98.4	2.4*
FBW (Lbs.)	21.9	19.9	-9.1*	31.7	29.3	-7.6*
Rel. Fat (%)	13.2	11.9	-9.8*	24.5	22.7	-7.3*
Leg Press (Lbs.)	897.4	1130.4	26.0*	658.9	853.3	29.5*
Curl (Lbs.)	85.0	101.1	18.9*	44.7	49.5	10.7*
Bench Press (Lbs.)	146.3	170.3	16.4*	54.1	69.6	28.7*
Hand Grip (Kg)	51.3	53.9	5.1*	29.3	33.1	13.0*
Girth (CM):						
Shoulder	115.1	116.3	1.0*	101.4	102.0	0.6*
Chest	95.2	96.1	0.9*	84.4	85.0	0.7*
Bust	--	--	--	88.7	89.1	0.5
Hips	95.7	95.6	-.1	94.9	94.5	-.4
Thigh	55.2	54.9	-.5	54.0	53.8	-.4
Biceps	28.6	29.3	2.4*	24.7	25.3	2.4*
Forearms	27.4	27.9	1.8*	23.5	23.6	0.4

Source: Wilmore, J. H. Alterations in strength, body composition, and anthropometric measurements consequent to a ten-week weight training program. Medicine and Science in Sports, 1974, 6, 133-138.

*p. 05.

Question: Were all of these studies done by the military?

Answer: No, they weren't. One of the reasons I was particularly interested in the Wilmore report was because he used college-age men and women, and I'm always looking for studies that used subjects about the age of recruits or of people in their first enlistment. The Wilmore study is one of the better ones I have found that addresses matters of particular relevance to the military services.

Table 3, which pulls together the statistics for (1) subjects used by Wilmore and by Snook and Ciriello and (2) Navy recruits, allows us to compare strength to weight. Based on these statistics, I would question the relevance of the Navy's weight standards for enlistment and reenlistment. It appears that, if we need to broaden the pool from which we take our men and women accessions, we might consider accepting some heavier recruits and keeping some heavier career people. The Rand Corporation did a study a few

Table 3

Strength Relative to Body Weight

Measure	Men			Women		
	Strength	Weight	S/W	Strength	Weight	S/W
Wilmore Subjects--Post Training						
Curl/WT	101	161	0.63	50	127	0.39
Curl/LBW	101	141	0.71	50	98	0.51
Leg Press/WT	1130	161	7.00	853	127	6.70
Leg Press/LBW	1130	141	8.00	853	98	8.70
RTC Recruits--Post Training						
1-Arm Pull/WT	157	156	1.00	93	130	0.72
2-Arm Lift/WT	100	156	0.64	61	130	0.47
Snook and Ciriello Subjects						
Continuous Lift	54	164	0.33	37[a]	144	0.26
				21[b]	128	0.16
Initial Pull/WT.	70	164	0.43	59[a]	144	0.41
				45[b]	128	.35

[a]Industrial

[b]Housewife

years ago looking at all recruiting disqualifications (Chu & Norrblom, 1974). They found that the major disqualifiers were physical reasons, and the major reason for physical disqualification was weight. Based on informal conversations with recruiters, it appears that they may be turning away applicants at the door for merely looking overweight! After all, we don't have to use everyone of them for a picture on the recruiting posters. Perhaps we should reconsider our weight standards.

From the data we gathered at the Orlando RTC, we also computed the ratio of fat body weight to lean body weight for a "fatness" index. We correlated that ratio with the ASVAB scores of those recruits and found, in the case of men, that there were positive correlations with three of the ASVAB subtests: mathematics knowledge, electronics, and general science. Table 4 displays the correlations. There was also a significant correlation between that ratio and educational level. There were no similar findings with women. All of the correlations for women were nonsignificant. Of course, we have to keep in mind that there is a difference between recruiting standards for men and for women. Recruiters were not accepting any women who had less than a high school level education, so we did not have much variance on the education level measure. I recently found another study in the literature that is consistent with these findings (Garn, Bailey, Cole, & Higgins, 1977). That study showed that weight and fat body components for men correlated positively with both educational level and income, but negatively for women.

Table 4

Correlation of Fat/Lean Body Weight (F/L BW) with ASVAB Aptitude Test Scores and Education Level (N = 275 Male Recruits)

Item	r	p
Mathematics Knowledge Subtest	.11	.039
Electronics Information Subtest	.13	.014
General Science Subtest	.17	.003
Educational Level	.18	.001

Note: Correlations of F/L BW with following ASVAB subtests were not significant: General Information, Numerical Operations, Attention to Detail, Work Knowledge, Arithmetic Reasoning, Space Perception, Mechanical Comprehension, Shop Information, and Automotive Information.

The study was done in an average, medium-size town in the midwest, using a very large sample of some 5000 individuals. However, the women in the sample were usually spouses of the men in the sample; that might have had some biasing effect on the selection of the sample women.

As I mentioned, we are quite interested in the ergometer measure, because it seems to simulate a lot of Navy job tasks. We did a multiple regression analysis using some of the measures in our physical test battery as predictors, with ergometer performance as the dependent variable. The results are shown in Table 5. Notice that, for the men, weight came into the equation first, so weight was the best single predictor of ergometer performance; that is, ordinary total body weight correlated .40 with ergometer performance. With the combined samples of men and women, sex comes into the regression equation first, as an additional variable, emphasizing the substantial differences between the two sexes in performance on the ergometer.

Question: Did you do any studies using height?

Answer: We intercorrelated all of the variables including height. Height had lower correlations than weight with practically everything else we measured.

I want to spend a few minutes discussing the importance of looking at what is called distribution overlap. There are studies in the literature that report women's strength as a percentage of men's strength; for example, on upper torso strength, the women's average is 60 percent of that of men. It can be very misleading to look at these kinds of percentages of average scores, and it is much more important to look at the percentage of distribution overlap. For example, Figure 5 shows a situation in which there is an average of 60 for one distribution (e.g., women on some strength measure), and an average of 100 for the other distribution (e.g., men on the same measure). So, the lower average is 60 percent of the other average. Notice, however, that there is very little distribution overlap, so the variation in the distribution becomes far more important than, or at least equally important as, the averages in making these kinds of comparisons. Table 6 displays some male-female distribution overlaps for the data obtained at RTC Orlando. Looking at

Table 5

Multiple Predictors of Upper Torso Power
(Criterion: Ergometer)

Predictors	Multiple Correlation	Cross Validation
Men		
Weight	.40	
Pull-up	.52	
Sit-up	.53	
SKF-Tricep	.55	.54
Women		
Arm pull	.37	
Weight	.43	
Push-up	.47	
Sit-up	.49	.51
Men and Women		
Sex	.80	
Weight	.83	
Pull-up	.84	
Sit-up	.85	.85

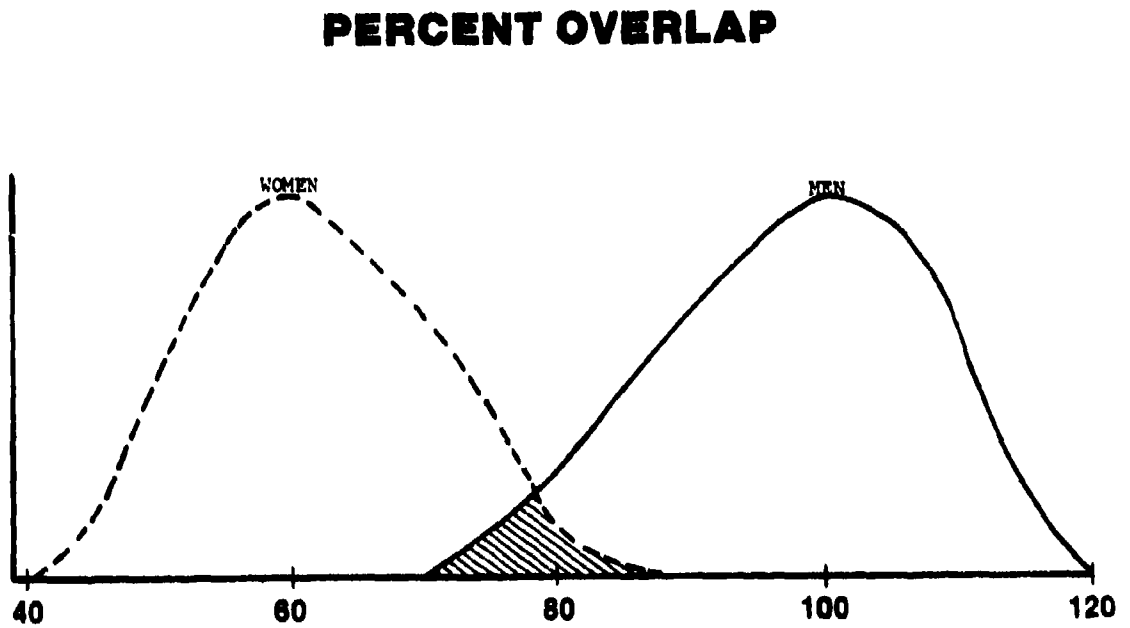


Figure 5. Percentage overlap on some strength measures for men and women.

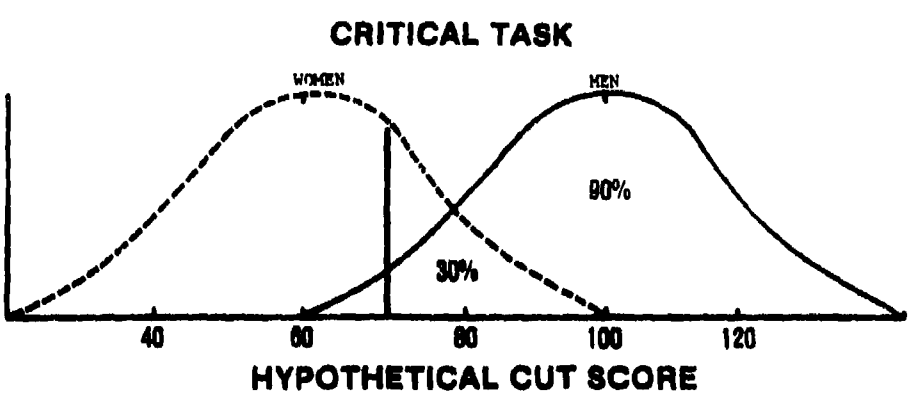
Table 6

Percent Overlap of Pretest Measures

Measure	Sex	Mean	SD	Percent Overlap
Sit-up	M	18.0	3.3	
	W	13.6	3.0	49
Push-up	M	13.7	8.1	
	W	1.9	3.2	14
Pull-up	M	5.9	3.6	
	W	0.3	0.8	20
Bent-arm (Seconds)	M	33.3	14.4	
	W	7.8	6.4	22
Grip (KG)	M	45.9	7.8	
	W	28.2	6.0	20
Pull (Lbs.)	M	147.5	26.1	
	W	79.3	17.5	12
Lift (Lbs.)	M	104.7	17.5	
	W	61.0	11.4	13
Ergom (Revs.)	M	58.4	9.4	
	W	35.0	8.5	19
Weight (Lbs.)	M	158.0	26.0	
	W	128.0	14.4	46

upper torso strength measures, both static and dynamic, we find there are very small overlaps. So, it is extremely important to know what the distributions look like. The proportion of one mean to another mean becomes almost irrelevant.

Let's think in terms of some hypothetical task out in the fleet. To perform a task, let's say that an individual must be capable of achieving a strength score of 70 or better. Let's take two distributions, such as shown in Figure 6, which one mean is 60 percent of the other mean. Putting the minimum or "cut" score at 70, we find that only about 30 percent of the low group could perform that task. When we are addressing the question of how mixed groups would affect a division or a team, the shapes of these distributions become very important. Once we know the distributions and the required strength, it is simple arithmetic to calculate the percentages of those in the total division who could be expected to be capable of performing a task.



	W M	W M	W M	W M	W M	W M	W M
% WORK GROUP MIX	0 100	10 90	30 70	50 50	70 30	90 10	100 0
% EACH GROUP QUAL'D	— 90	3 81	9 63	15 45	21 27	27 9	30 —
% TOT. GROUP QUAL'D	90	84	72	60	48	36	30

Figure 6. Percentage overlap of performance distribution of men and women.

Question: Could you discuss the so called X-factor used by the Air Force?

Answer: The test is one of lifting a certain object. The score is X-1 if the subject can lift 70 pounds from floor to eye level; X-2, 40 pounds from floor to elbow height; and X-3, 20 pounds from floor to elbow height.

Until the actual lift-testing machines are delivered to the AFEES, a man or woman applicant's X-factor capability is estimated by the examining medical staff. These "eyeball" estimates were found to be very inaccurate. To illustrate, they found that, although examining physicians had estimated that 90 and 59 percent of men and women applicants respectively were capable of X-1, 99 and 29 percent were actually capable of X-1.

I said that I would mention a few words about the part of our project in which we are identifying the most muscularly demanding job activities for our criterion tasks, covering all of the Navy ratings and some 25 selected Navy Enlisted Classifications (NECs). We limited the NECs to those that appeared to have substantial physical demands (e.g., saturation divers, underwater demolition team members). Several thousand of these tasks were documented by 1500 men and 800 women job incumbents, and by 650 unit commands. We will do a follow-up by going out into the field to make objective measurements of the actual physical forces required to do some of these tasks, designing and administering performance tests of these tasks to validate the Strength Test Battery (STB).

As I mentioned earlier, one of the issues that the results of this study have raised involves what is appropriate for the recruit physical conditioning program. We may have to increase the conditioning activities devoted to developing the biceps, since it appears that they are used, perhaps more than any other muscles, in Navy tasks. To illustrate, I have here a listing of critical job tasks identified by type of basic body effort (BBE):

1. Lift--without carry
2. Carry--walking
3. Carry-running/swimming
4. Push-repetitive
5. Push-distance
6. Pull
7. Squeeze
8. Turn--lever
9. Turn-wheel
10. Swing--repetitive
11. Swing-distance

Now, looking at the tasks documented by deploying commands, we find that about 80 percent of the shipboard activities were BBE type 1, 2, or 6; that is, they involved lifting, carrying, or pulling types of activities. Very few tasks involved BBE 3. It appears therefore that conditioning during recruit training may not be really relevant to the world of Navy work.

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SEX DIFFERENCES

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Maybe a good place to start is to address the reasons why the changes in sex roles we hear and talk about are happening. We know that many people find these changes profoundly irritating. They seem to say, "Good Heavens, I wish this whole thing would just go away; why can't we go back to normal?" In fact, some business people we have talked to say things like, "Oh, affirmative action, yes, that is last year's problem." There are people on the college campuses who say, "Oh, yes, it is just like the civil rights issues in the 1960s--it is one of those things that gets everybody passionately excited and involved, and then it dies away. If you just wait awhile, sort of drag your feet, and pretend you are going to do something but postpone doing it, things will get back to normal." Well, we are going to try to tell you why we think they are not right.

We think that the women's movement is based, in part, on some very profound biological and life cycle changes. This first came home to me [Professor Maccoby] when I was at a conference in Paris that was attended by a student of population from Italy. He had some tables that really startled me. He was contrasting the life situation of women today with that of women 100 years ago. At that time, the figures showed that women had, on the average, six live infants and several who were either born dead or lost at various stages during gestation. When they had a live infant, they breast-fed it for about 16 months. They lived to about age 44, on the average, and started having their children at 19 or 20. Now, just put those figures together in your mind and figure out what proportion of a woman's adult life was involved in bearing, breast-feeding, and taking care of young children. Her youngest child was just about age 6 when she died, on the average.

Now the situation is that women live, on an average, about 74 years. They have two children, and their youngest child is in school by the time the mother is 32. They breast-feed a child 2 or 3 months, if at all. So, if you believe that the lives of young women are to some extent dictated by the fact that they bear children, think about the enormous proportion of women's lives no longer involved in childbearing and rearing. We should realize that many women are now ready to say, "The domestic sphere is of interest to us, but it is no longer our whole life."

It seems to me that even Ayatollah Khomeini in Iran is not going to be able to hold back the tide with the palm of his hand when it comes to the changes that are happening in the lives of women. Now, quite obviously, these are profound changes in the lives of men, too. Men used to be bound into their roles as providers for the woman and a large family of children through most of their adulthood. Now, there is a different relationship between the sexes and there is certainly a different relationship of both sexes to the world of work, which now is going to be shared between two sexes. I do not see any way in which these trends are going to reverse. All of this leads to the question, "What are the sexes really like?"

Apart from the issues of childbearing and the issues of mortality, per se, can we say anything about psychological characteristics of men and women, boys and girls? Are the sexes somehow driven in certain ways with different kinds of motivational systems that

are going to make people of one sex more suitable for one kind of occupation, or more interested in different kinds of life endeavors, than the other sex? We do not start with the doctrinaire position that men and women are exactly alike, except for the obvious physiological differences. We have tried our best to make this an open, scientific question. We have wanted to find out and to sift through the evidence and figure out what we know and what we do not know.

One of the first things that got us started on the work we have done was our sense of despair about how difficult it was to arrive at some answers to what ought to be some very simple questions. One sees textbooks claiming such things as "girls are more responsive to human voices than are boys, but boys are more responsive to visual stimuli." Somebody made that claim! We did an experiment with children of different ages, testing them with auditory and visual stimuli, and found no difference. We started looking through the literature and discovered that one person had found a given sex difference that had become a part of the literature and had been quoted in numerous textbooks. Fifteen people had found no difference, but their failure to replicate the findings never appeared anywhere. Sometimes those who failed to find the difference would have a little footnote saying, "There must be something wrong with the way we did our studies" or you would find that, even when they had data showing no sex difference, they would never record this in their writeup. We started writing to people who had done studies and who we knew had the necessary data for comparing sexes. One marvelous case concerns a "prisoner's dilemma" study where women were shown to be more untrustworthy then men; that is, they would sell out their companions for a price. One study showed a sex difference, and 28 studies showed no difference, but the first study was quoted. It was bizarre.

We then began to look at what people believe about the way sexes differ. One of the things you will find is, especially when people are talking about children, that people say girls are timid, and boys are bold. We set up in our nursery school at Stanford a "walk-the-plank" experiment, which involved walking on a rail 4 inches wide and 6 feet long--built so we could raise it from one height to another. The kids got up on it by climbing 1-foot high blocks without railings, so the business of climbing to the rail for a little tiny child was not easy. Of course, we had tumbling mats underneath so they would not hurt themselves if they fell off. What we asked the kids to do was to walk across the rail. Some of our 4-year-olds would walk across. I can still remember a child getting out in the middle of that bar and doing a kind of arabesque and saying, "Hey, just look at me" (that was a little girl, by the way). Other kids were scared to death, and they would hunch across that rail on their bottoms. They would not even stand up and walk across it. The point is that an equal proportion of boys and girls was timid or bold. Then we repeated the experiment with the fathers of the children in the room, because we thought that maybe the boys would feel that they had to be brave in the presence of their fathers and the girls would get all clingy and timid. No, that did not happen either. Now, whether this was because we were working in a university nursery school, where the fathers do not put quite so much pressure on their little boys for being tough, I do not know. But, in any case, what these fathers said to us when their boys did not particularly want to walk across the rail was, "He does not like heights." They seemed to understand that this was true of their child. They did not worry about their son being a coward, or anything of that sort. They just said, "Well, he is a little boy who does not like heights yet"--or something of the sort. The only difference we saw was that the fathers and daughters would take hold of each others' hands more often than would fathers and sons. So, again and again, when we have done experiments because we were frustrated with the state of the literature, we have not been able to document sex differences that had been alleged to

exist. We began to come up with the feeling that we have many stereotypes that do not fit the characteristics of the two sexes very well.

Well, have any of our stereotypes been confirmed in any way? Some have, and let me tell you about one recent experiment that does confirm one stereotype.

We carpeted a room very deeply so that it was comfortable to fall down on the floor. Then we put in one of those little trampolines that is an innertube with webbing across the top of it. We would bring in three children at a time, either three girls or three boys together. We also had a beach ball in the room. Half way through the experiment, we brought in one of those big inflated Bozo dolls that have weighted feet and a big red nose. These dolls are meant to be hit, and if you punch them they will come back up again. We watched the children through a one-way mirror to see what they would do. One of the things we did was to measure how active they were, in the sense that we would see how much jumping, running, and so on that they did. There was not much difference between the boys' groups and the girls' groups in how active they were.

There was a very interesting qualitative difference, however, in the kind of activity that they engaged in. If one of the boys would throw himself on the trampoline, the other boys would throw themselves on top of him, or they would rush at each other and bang shoulders, tackle each other, or bring each other down. If one of them got hold of the beach ball, he would throw the ball at one of the other kids and hit him. Now this was not aggression in the usual sense of the term; we try to reserve that word for efforts to hurt another person. These kids were having a marvelous time. They were just grinning and shouting and laughing. Once in a while, you would see a kid sit on top of another kid. If the one underneath would start to complain and want to get out from under, but the one on top would not let him up and would begin to look as though he was enjoying holding him down, we called it aggression, but that was quite rare. Now what were the girls' trios doing? They more often organized, and they would say, "Okay, we will take turns." Then they would argue about whose turn it was and whether one of the girls had had too long a turn.

Now, this was, on the average, about the biggest sex difference that we have seen in any of the work that we have done. But here is the curious part of it. Suppose that you give each child a score for what we called rough and tumble play, which was a combination of the score for wrestling and the score for playful attack. The distribution of these scores for the two sexes had different means: The average for girls was lower than the average for boys. The usual statistical treatment of the data will show the means to be significantly different from one another, and one would say, "Wow, look at the sex difference I got." But, if you look at the distributions more carefully, you realize that 75 percent of the boys act quite a lot like most of the girls and 25 percent of the boys behave in a way that you do not find girls behaving. Since we do not see any girls behaving that way, we describe the behavior of the boys who did the most wrestling and rough-housing as typically boyish. We do not notice the 75 percent of the boys who were not acting like that.

Exactly the same kind of thing happened with the rule-making, rule-quoting, and organizing behavior of the girls; that is, about one-quarter of the girls exhibited a lot of that sort of behavior, more than we saw in any of the boys' groups, but the rest of the girls were indistinguishable from the average boys in that behavior. Now this leads to a point that we find extremely hard to explain. It is, in fact, hard to keep uppermost in our own minds, because we keep drifting whenever we get a sex difference, like the one in

aggression, into the idea that males are aggressive and females are not. Nothing could be further from the truth. There is an enormous overlap between the sexes for any psychological trait that you can name. Most of the psychological traits we would be interested in measuring do not even show a sex difference on the average. But the few that do show a difference have distribution overlaps like that I just discussed. We have that awful tendency to name a trait as either masculine or feminine when there is any sort of difference between the sexes' averages.

Question: Do you have any historical data against which to compare findings on rough and tumble play?

Answer: No, not precisely. The best answer I could give you would be from the big longitudinal studies. One a study was done at the Fels Institute in Ohio, in which a fairly large group of kids was followed from birth (Kagan & Moss, 1962). Now these kids are 45 years old, or something like that, so we can go back through the history of their childhoods. They were not measuring rough and tumble play specifically, but the little boys in their samples were more aggressive in nursery school and in summer camps than were girls. When they used the term, they included rough and tumble play. I do not think that particular sex difference is one that is very time- and spacebound.

Another approach to answering your question comes from the cross-cultural work in which the Whitings, anthropologists at Harvard, sent teams to about 10 different small societies around the world, including some in India, the Philippines, Mexico, and Africa (Whiting, 1963). All their field teams were trained to make the same kind of observations. What they did was pick out a group of preschoolers and a group of kids between 8 and 10 years old; they followed them around and time-sampled what they did all day. They, too, found that the boys are more involved in aggressive activity than are girls.

Question: Getting back to your study, did you find the average boy to be significantly different from the average girl in regard to rough and tumble play?

Answer: Yes. There is a significant difference between the means. In addition, when aggression occurs often enough to score, we almost always find males being more aggressive, on the average, than females; that is the case for all the ages that people have studied. For awhile, we thought that girls showed more verbal aggression than boys; and boys, more physical aggression than girls. We no longer think that is true. What seems to happen is that, when boys are going to get into a fight, they start it with a lot of taunting and name calling, so that there is a lot of verbal aggression as well as physical aggression between the boys.

Remember that aggression in the narrow sense is a very rare contingency. You can walk into a nursery school and pick out any child at random as your target child, and watch him or her for quite some time before you see the child get into a fight. The fact that males are more aggressive, and I really believe you can say that they are, does not mean that they are highly aggressive or aggressive all of the time.

I am worried about you picking up on that difference between the sex's average, and I am wondering where you want to run with it. I envision you as people who will become policy makers; you might use a sex difference in aggression to decide to keep women out of a variety of places where "aggression" would be appropriate. Maybe that is a good thing to do, but I would ask you to apply the same rules to men and women.

I do not believe that male recruits are tested to decide who is more aggressive and who is less aggressive for use in placement decisions. Therefore, it would be very wrong to decide that because women, on the average, are less aggressive, they should not be allowed to go to any combatant ship, which would keep them from going where they also might learn trades and skills.

The distributions for rough and tumble play show a large sex difference, compared to distributions on other traits. If I were going to show you differences in verbal abilities between males and females, you would see largely overlapping curves with a few males at the bottom end--males who have speech difficulties and reading difficulties--which leads to an average sex difference in verbal abilities.

Question: Could you give us a list of the physical, emotional, or intellectual traits in which you think there are sex differences?

Answer: We certainly could do that; however, we recommend that you refer to our book, entitled The Psychology of Sex Differences (Maccoby & Jacklin, 1974), because it took some 300 pages to describe those differences.

If we just listed them, you would miss most of the richness. Also, you would not conclude that "Most males and females have scores falling in the distribution of scores of the other sex." I think this is an important thing for you to realize. Just listing differences is going to make you think of nonoverlapping distributions--males are here, females are there--that would be wrong, completely wrong.

Question: Have you looked at the object of the aggression; for example, male aggression toward females, female aggression toward females, etc.?

Answer: Yes. Both males and females are more likely to be aggressive towards males than towards females. There are exceptions, as when women are in cars. Suppose you are the experimenter, driving a car. Your job in this study is to sit at a stoplight when the light changes and not drive forward. If you are a female, you will experience much more aggression--males and females honking at you, shaking their fists, swearing at you--than if you are male. So, in certain situations, women will elicit more aggression. However, this is the exception. Most aggression is between males.

I worry about people transferring nursery school or staged experimental data to other kinds of situations like combat situations. There are studies, which I am not too familiar with, on women in the California Highway Patrol (e.g., Bem, 1978). The highway patrol had one class that was almost equal in numbers of males and females. The women in these classes have been tracked to see how they are doing in "combat" situations. I think that research is probably something the services need to know about, because it is probably closer to what you are interested in than the kind of research on aggression that I can report.

Question: Do you see any differences among the socioeconomic classes in aggression by the sexes?

Answer: Probably not. However, most of the research has been done with white middle-class people; we can't speak with as much confidence about other groups.

Question: If 25 percent of the boys do not act like the rest of the boys as to aggression, what do you think leads that 25 percent to act that way?

Answer: We are spending much of our lives trying to answer that! We are codirecting a longi inal study right now in which we are studying children from birth. We have seen their parents since birth, and we have been trying to look at things like active play with their fathers and their mothers and to determine whether that relates to rough and tumble play at later ages. We also have hormone scores on these children at birth. We assayed five sex steroid hormones from the umbilical cord plasma. We are trying to understand the social forces and the biological forces that go into the differences we are seeing at nursery school. At this moment we think what we are finding is that you can get a hormonal cause and a social cause for the same behavior. If we find a hormonal relationship, that does not mean we will not find an equally strong or even stronger relationship with, say, "parental" behavior. Behavior is determined by multiple causes, not a single cause.

Question: Do you think these sex similarities or differences hold true regardless of life style or age?

Answer: Probably not, although most of the research has been done on nursery school children and college students, and we know less about other ages. There is some indication that men and women become more sex-typed, and more different from each other, while their children are young; they are more similar at earlier and later points in adulthood. There are a few good studies on aging. There are the Terman studies (c.f., Terman & Oden, 1959) that followed gifted children. The people in the Terman studies are still being followed, and they are now retiring--their average age is now 65 to 70 years. But most studies have not looked at women and men after college age.

Question: I was just wondering if one of your assumptions is that what you find in children is going to hold true throughout their lifetime?

Answer: Some things have a large impact on adulthood. One is what you do as a career. The Terman study has shown that the type of occupation you choose changes your IQ and your verbal ability. That is, certain occupations have a deleterious effect on your IQ, and others have a very good effect on it. Occupations are not the same for the sexes, but occupation, not sex, explains ability changes.

Another very good variable to use in discussing the life cycle changes is aggression. If you watch children through adolescence, you find that aggression in young children is qualitatively different from that in older children. Young children hit each other, usually to get some object. They are not hitting to get even for an insult to their ego as they do when they get older. When you get into the grade school age, then it is, "Do you know what he called me?" You get an expression of anger toward another person that is in accordance with what you think you have a right to do to the other person. Most kids, not all, accept the right of their parents to punish them. As one gets older, aggression is used to maintain your place, your position, or your status. But, for both sexes, and particularly for boys, you find a decrease in frequency of getting into fights. You find that most people had their last fight before they were 10 years old. People have that kind of aggression under control.

Question: I am really having a hard time with your definition of aggression. In the way that we in the military use it is considered good to be aggressive, but you seem to be stressing negative aspects. Aren't there positive aspects to aggressiveness?

Answer: I would like to separate assertion from aggression. We may have been mixing those two up. Assertion is usually thought of as standing up for your own rights. Aggression, however, is behavior intended to hurt somebody, but not in self-defense.

Question: Is there a correlation between aggression and assertion, as you define them?

Answer: A simple answer might be that aggression and assertion are correlated if, by assertion, you mean being dominant, making yourself higher in status, or stronger, or better. Other kinds of assertion, like that of an assertive salesman, are not included under aggression.

Queston: Sex differences have pretty well defined the roles of women in the military now for about 30 years. Now, with manpower shortages, women are being asked to step out of traditional into nontraditonal roles. What could you give us that would help us make that adjustment?

Answer: Well, that is a large question. A lot of the problems are stereotypical; for example, the stereotypic belief that women are more emotional so, if you put them in a stressful situation, they will break down and cry. One of the things we could talk about would be mood swings--emotionality and menstrual cycles.

Question: I think I would like to make a minor digression and take you back to aggression. Did you consider birth order?

Answer: Yes. We were forced to, because we are studying the relationship of hormonal factors to aggression and other behavior, and hormones differ by birth order. The level of testosterone, the male hormone, in the umbilical cord of the first-born boy will be higher than that for a second boy born less than 2 years since the birth of an older child. And it matters how closely spaced the children in a family are. We are finding the same thing for female hormones, such as progesterone and estrogen. Second-born, closely-spaced boys are like girls as to the amount of testosterone in the umbilical cord. Testosterone is probably the most potent male hormone.

Question: What is the length of time until that hormone gets back up to the first-born level?

Answer: About 4 or 5 years. But hormone level probably just accounts for a small portion of the variation in aggressiveness, if any. You know, there are all kinds of social variables to examine. However, the hormone variation by birth order is a good example of the other factors that may just be more powerful than gender but we never think of asking, testing, or dividing males on any of these criteria.

Getting back to moods, it may be of interest to you that males have mood swings and monthly cycles. For years we have worried about and studied mood swings in women, and we have looked at hormonal changes in women, but no one has looked at hormones in men over monthly periods. Now there are a few studies that have looked at male hormonal patterns. Two such studies have been published by Stanford faculty members (Doering, Brodie, Kraemer, Becker, & Hamburg, 1974; Doering, Brodie, Kraemer, Moos, Becker, & Hamburg, 1975). What they did is quite simple. They took blood samples every other day from men for 60 days. They also had them keep mood diaries. Approximately half the males had clear depression cycles. In half the males, there was no relationship between

their hormones and their depression, but in half there was a clear relationship. They also found monthly testosterone cycles in about half the males. The work was only done over 60 days, however, and it would have required a longer time period to identify longer cycles. The researchers think that the mean length of the cycles that they were able to document cycle was 28 days! Males do not have any outward sign of their monthly testosterone cycles. Females may be in a better situation because, having an outward sign, they can more clearly label the cause for depression that might be related to their hormones. In the studies of male cycles, it was not just depression that varied with hormone concentrations. They had a little behavioral test where, when they took blood samples, they instructed the nurses who took the samples to be "clumsy" so the men got poked a little more than normally necessary. It was found that their tendency to get angry at the nurse was related to where they were in their testosterone cycle. This is an important area of research. We have assumed that women have mood swings and we had not looked at the males to find comparable things. This is an example of an important similarity of the sexes.

Question: I am curious as to what degree of variability there was in mood. Do you know?

Answer: There was tremendous variability in both hormone level and in mood. There are men who do not have very large mood swings, and there are women who do not have a cycle-mood relationship. Men and women do have hormone/mood correlations.

There has been a lot of work with women in athletics, in regard to their cycle and their performance in races. It turns out that performance is not related either to menstrual cycle or to how well people think they did. People are not good at saying how well they have done before they know their actual score. Sometimes they feel awful, but they do well. Sometimes they think they did well, but they did not. Some people's moods do determine how they feel about how well they have done, but they do not affect what they have actually done.

Question: Does actual physical strength performance correlate at all with these mood swings?

Answer: No, it does not. Again, how you feel about performance is not related to how you do, but, in some people, it may be related to hormone cycles. I think this is an important point. Suppose you are dealing with a group of women who, in fact, do have mood cycles. You think mood must be associated with performance, so you give them 2 days a month off, or something of the sort. That is a misconception because the vast majority of women work right through menstruation. They may not feel quite on top of the world, but it has nothing to do with how they perform their job.

Question: Are there sex differences in values and interests?

Answer: Yes, and this varies a lot with life cycle. I think that we find big sex differences in values and interests in high school. This is sad in a way, because a lot of young women are very preoccupied with how attractive they are to the guys in high school. I guess the guys are a little preoccupied with their attractiveness to girls, but the girls are really thinking about that aspect of their lives. They tend to think, "Oh well, it's not going to make much difference what I'm doing in school now." That is one of the reasons why we think girls stop taking math courses. When these women enter college, we find that about 80 percent of them do not have enough math background from high school

to get into the science courses, so they are not eligible to become premed or engineering students.

We are now beginning to feel that high school is where a lot of the action is--where the interest divergence between the sexes grows. The males at that age are still thinking, "I'm going to have to have a full-time job and I'm going to have to support myself and maybe a family and I had better get myself set up to be an engineer, or whatever it is I want to be." The women are not thinking that. Now, in point of fact, when they get to be 30 and they are looking around for new horizons and a way to live their lives, they say, "Why did I do that?" or "Why didn't I do, back in those days, what I might have done?"

When people are dealing with young people entering the armed forces, they are going to find that there are some differences between the level of preparation of young men and women. Girls are generally better students in high school; that is, person for person, when they take the same kind of work, they get higher grades. It is very hard to know whether this is because the teachers are rewarding them for effort and they are more oriented than are boys to settling down to do what the teacher asks. It is true that more males in high school get into trouble and drop out. The fact is, given that the two sexes have taken equal kinds of preparatory work, there is no question that the women are as well trained and as competent as men. The issue will be, "What are they qualified to do?" You may find that, if you want to employ them in jobs they are not prepared for, you will have to train them, but that must be true for a lot of jobs for men in the armed forces.

Question: Do you perceive any change in society in preparing women physiologically, such as encouraging more athletes?

Answer: Oh yes. Up until a few years ago, around $200 were spent for every male in high school (on athletic-related items) compared to $1 for every female. There is still a terrible inequity in the amount spent on males and females for high school athletics. Nonetheless, there have been changes and a huge increase in athletic participation by girls in high school. This is one of the things that is cheerful from our standpoint, and we hope from yours too. Young women are now taking college preparatory courses that they did not try before. The enrollment of girls in higher math classes is increasing. There are more and more young women coming into engineering at Stanford, for example. The services are going to reap the benefits of that to some extent. You are going to find women coming in ready and trained to undertake your jobs and programs.

Question: How much of this is due to the changes in family style? I ask that because I was reading through an article you [Professor Maccoby] wrote in 1963 for a symposium about intellectual development of females. You implied that, for a female to develop analytical abilities, generally she had to be tomboyish and be treated like one by her parents. At least, her parents had to accept her behavior. Are parents stereotyping their kids?

Answer: Yes, but I am not sure how much difference it makes. There is still a lot of very subtle stereotyping that is done by parents at an early age.

I was on a TV program recently in England, and one of the English psychologists was telling me about a study they had just done in which they dressed a 6-month-old baby either as a girl or a boy, and they watched to see how adults played with it (Smith & Lloyd, 1978). One of the things they found was that, if the child made a quick sudden sort of excited movement and the person playing with the child thought it was a girl, they

would try to soothe her, pick her up, pat her, and say something like, "That's all right, honey," as though they believed the child was upset or frightened. If they believed the child was a little boy, they would give it a toy and say, "Whee, let's play." So, if you do that over a long period of time with a small child, you are creating a kind of expectation of energy and outgoingness in the boy, and a readiness to be soothed and cuddled in the girl. We do not know what that all feeds into as the children grow older, but I think that, in answer to your question, there probably are fewer divergences now of that kind in the treatment of the two sexes.

I know that there are certain conscious efforts on the part of many parents not to make such big distinctions between their sons and daughters. There are certain things the children seem to impose upon themselves, and why they do this is something that really bothers us--we do not quite understand it. We notice that the children in nursery school spontaneously segregate themselves by sex, and they do that even in the early grades of school. Of course, by the time they get into adolescence, they want cross-sex contact. However, in the early ages, even if the parents are trying not to sex-stereotype, the children somehow do it themselves. We do not know whether they get it from television or what, but boys will charge a boy with being a sissy if he plays with girls all the time. That does not surprise you and it probably seems so natural to you that you never asked yourselves why boys do that, but I do not think that parents are imposing that on their children. It comes from somewhere else.

Question: How about areas where there are sex differences?

Answer: There seem to be several intellectual or cognitive sex differences that we could at least mention briefly. I am just giving you a very quick summary. If you are interested in the area, I urge you to look in our book. One sex difference that I mentioned is in verbal abilities. It turns out that girls and women, on the average, have higher verbal abilities than do men and boys. But the difference is very small, probably trivially small. It may be that girls start to talk earlier. How you measure verbal ability is a problem that comes up in developmental psychology over and over again. You have to measure it differently, depending on how old the children are. When children are just learning to talk, you can measure age of beginning to talk or mean length of sentence. When they get older, you start looking at different tested verbal abilities, and it gets more and more complicated. There are a number of ways one can test verbal ability. Verbal abilities probably differ very slightly between the sexes, primarily because many more boys than girls have trouble with reading or speech. In remedial classes, there are about ten boys to every one girl.

Question: If we could briefly clarify some of your terminology, you are saying that, although these are statistically significant differences, they are slight?

Answer: That is exactly what I'm saying.

Question: What is the magnitude of this difference?

Answer: The magnitude of the verbal difference is very small, less than a quarter of a deviation. You have to consider the population you are measuring. If you go into the standard high school, and you check everyone who is there 1 year as a freshman, everyone who is there the next year as a sophomore, and so on, you are not testing identical groups. Boys drop out of high school at a faster rate than do girls. So, if you go into the schools and test everyone who is there, you are testing a heterogeneous group of girls and an increasingly homogeneous and brighter group of boys.

The other major intellectual sex difference is in spatial visualization. Spatial visualization ability is usually defined as the ability to rotate objects in your mind. You probably have taken spatial tests--almost everybody has. You may be shown a picture of a set of gears and asked which way wheel F will turn if wheel A is turned in a clockwise direction, or you may be asked what pieces would fit together to form a rectangle. Such questions tap your ability to rotate objects in your mind. There is a sex difference that begins in junior high school and high school years. Boys, on the average, have higher spatial ability than girls. It is a larger sex difference than that found in verbal abilities. Some new research suggests that one can learn spatial visualization in higher mathematics courses. One contribution to the sex difference is the fact that girls do not take as many higher mathematics courses as do boys. In any case, we do know that spatial performance improves quite readily, with practice, in both sexes.

The final intellectual sex difference may be in the mathematical aptitude. From adolescence on, males on the average do better in math.

Question: I read somewhere that these differences between the sexes may be physiological, that the actual brain hemispheres are different. I wonder what your thoughts are about that.

Answer: This is an active area of research, and we are embarking on some of that work now. Our brains are specialized to some extent. We find out about that specialization from the effects of certain kinds of brain injuries. Often people who have been injured on the left side of their heads cannot talk very well or they cannot read. If they are injured on the right side of their head, that is not the case. By the way, little children can relearn quickly with the other half of the brain what they lost in the injured half, and older people cannot. There is a very malleable phase in growth, apparently, where you can pick up and fill in with the other part of your brain whatever the other half is not doing. That ability to switch quickly gets weakened and lost with age.

The question addressed here concerning sex differences is whether males continue to lateralize (to increase in specialization of brain hemisphere function) for a longer period of time than do females. You might find that the two sexes go right along equally on spatial abilities, which does seem to be the case until about age 11, and then girls continue to get better, but not very much, while the boys continue to get a lot better. Consequently, the sex differences get bigger as the children get on into adolescence. Then the difference no longer increases.

One hypothesis is that the sex hormones of puberty shut off lateralization at just about whatever level it has reached. The cutoff is going to happen sooner, on the average, for girls than for boys, because of the difference in maturation rates. One of the ways for testing this hypothesis on lateralization has been to test within sex and look for early maturers and late maturers. It is true that men who hit puberty later have higher spatial ability on the average than do men who reach puberty early. The same is true for girls. So there is a little bit of evidence here that the age of physical maturing may have something to do with some of these abilities. However, the picture that I have just given you is one that we would have presented with some confidence about 3 years ago. Now the new research is saying it is probably not quite like that, and you have to realize that lateralization proceeds at different rates for different functions.

It is not the case that men are more lateralized, period. They may be more so for some functions and women may be more so for other functons. Another thing we find is

that a male who is not very well lateralized for spatial ability is likely to be dyslectic. If a female is not very well lateralized for spatial ability, there is no effect on her verbal functions, which may be one of the reasons why women, on the average, are better verbally. So, pubescence is certainly not the whole story.

Question: But don't you think some people will use this research to say that women are not qualified to do certain things?

Answer: You have a very good point, and I worry about that. Spatial visualization is a learnable skill; we know it is learnable. When we talk about these things, it sounds like we are talking about something that is natural--that you are born with it and don't ever change, but that couldn't be further from the truth. We know that there are women who are high in spatial visualization ability. We know that it is not as big a sex difference as we found with rough and tumble play. So it becomes something that you have to test individually. We also know something about learning and that motivation helps a lot. The person who wants to do something is probably going to do it, even if it takes that male or female twice as long. So, if you have someone who is motivated, that motivation will outweigh some differences in initial abilities.

Question: Can you talk more about sex nondifferences and differences?

Answer: We have talked about aggression already. It does seem to be a sex difference--it is very hard to estimate the size of the difference because we use very small groups when we do aggression studies. In contrast, the studies on cognitive differences are done with much larger groups. Dominance, as in arranging yourself in a dominance hierarchy, may be a sex difference. We don't know about things like competition and cooperation. More research needs to be done, and sometimes cooperation and competition have aggressive elements in them. It is not as easy as you think to separate some of these things. Let me list some nondifferences. Memory is not a sex difference, but it is often thought to be one. It seems that you can get differences in memory by manipulating the contents of what you ask people to remember. Auditory and visual perception are not sex differences. You can find studies showing sex differences, but many more do not show sex differences. Interestingly enough, most analytic ability tests are spatial visualization tests. If you partial out spatial visualization from the total score, analytic ability is not a sex difference.

There are many social areas that we are not going to have time to discuss. It is alleged that women care what people think about them, and men don't care as much. This view is unwarranted. Among young boys, peers seem to be especially important. What their peers think of them may be more important to boys than to girls. Little girls, on the other hand, may be more compliant to adults than are young boys. There are some complicated questions here, and there still needs to be more research done. Usually, the teachers of young children are females. Thus, although a lot of studies have talked about adults, most of the adults who have been tested with compliance measures are female teachers.

Are boys and girls different in timidity? Probably not very much. Are men and women different in timidity? We don't know. We psychologists may not be able to do the proper experiments. Women are more likely to say they are afraid of more things than are men, but self-report is not exactly the same as what you actually do. If you look at the behavior of men and women, it tends to differ much less than what persons say about themselves. There may be a sex difference in activity level, but it is probably a

qualitative kind of sex difference rather than a quantitative difference. If you go into preliterate societies and watch the daily activities of men and women, quite often you see that the women are more active than the men; for example, women do more of the agricultural work. The sex differences in activity level seem to be very situational.

Let me [Professor Jacklin] quickly provide three lists: unfounded beliefs about sex differences, sex differences, and unsettled questions. All of these are discussed in our book published in 1974.

1. Unfounded beliefs about sex differences: Girls are more social than boys, girls are more suggestible than boys, girls have lower self esteem, girls are better at role learning and single repetitive tasks, boys are better at tasks that require higher level cognitive processing, and girls lack achievement motivation.

2. Sex differences that are fairly well established: Girls have greater verbal ability than boys, boys excel in visual-spatial ability, boys excel in mathematical ability, and males are more aggressive.

3. Unsettled issues about sex similarities and differences: Tactile sensitivity; fear, timidity, and anxiety; activity level; competitiveness; dominance; compliance; nurturance and "maternal" behavior.

Question: Do you have anything more on achievement motivation?

Answer: There have been some recent studies by a researcher who felt she had found a fear of success in women (Horner, 1968). She performed an interesting experiment, in which she gave men and women a projective test designed to measure the need for achievement. Both groups were given a sentence and told to write a story about the subject. In the women's version, the sentence was, "Ann is the top of her medical school class." In the men's version, it was, "John is the top of his medical school class." Notice that the researcher mixed up two different things in that study: the sex of the subject and what I call sex of the stimulus; that is, she didn't give men and women the same test. Women said terrible things happened to Ann: She cheated on the next test so she didn't come out so well, got sick, or even committed suicide! On the other hand, men said that John cured the common cold, won the Nobel prize, and just took over the world. However, other people have given both men and women both forms of the test and they didn't get sex differences; that is, men and women gave similar "Ann" stories and similar "John" stories. There is one more difficulty with this research. What one says in that story has not been shown to have anything to do with whether or not you would apply for promotion, for a graduate school, etc. In sum, I think we need to know a lot more about need for achievement.

Question: Do we know anything about problem solving by mixed-gender groups?

Answer: In a situation where a group of women are discussing a problem and trying to solve it you find that they do it in a different way than do a group of men. The women check out the options of every person in the group more often than do men and they seem to want more of a Jeffersonian democracy. Although the process used by women seems to be slower, the two groups arrive at a solution in about the same amount of time. Further, if there is an objective measure of how good the solution is, we find that the two groups arrive at just about equally good solutions. So the two styles are somewhat different, but neither one can be characterized as better. Now, of course, the big issue in front of us all

is what happens when you decide to integrate and you get these two styles together. We don't know very much about that, and it is another one of those areas of active research. One thing that we do know is that young people--young college age or late high school age women and men--have several agendas when they are interacting with each other. Women tend to feel that men will find them more attractive sexually if they don't talk too much, if they look up to a male and ask him questions instead of giving answers, etc. The guys think they are more attractive if they seem masterful, a little bit macho, and show that they know a lot, etc. So, in a mixed-sex group, you begin to get those stereotypic patterns.

One of the most fascinating studies I have seen in this general area is an experiment in which an artificial family was formed (Leik, 1963). The researchers brought together a man and a woman and a teenager. The man and woman were both from families with teenagers, but none of the three people had ever seen each other before. They were asked to sit down at a table and pretend that they were a family at the dinner table. What you got was the woman saying, "Oh, I hope you like what I fixed for dinner, Honey." And he said, "Oh, it's just fine, yes, and what did you do at school, son?" When you compare this with the behaviors of these same people when they are in their real families, there is nothing like this going on at all. People have a concept in their heads about how people ought to behave when they are in these roles. When they first meet other people, they start to fall into those patterns while learning about each other. People who have interacted with each other over a period of time aren't like that. They soon begin to see each other as individuals and the stereotypes drop out. In a sense, that is the message that I would like to leave with you.

We hope that we have conveyed to you the fact that there is a gold mine out there in the way of competent women who are becoming more and more trained for a whole variety of things. The women are a little bit scared about what they are getting into, and the men are scared about letting them in. However, when we get over the initial culture shock, we will find that the two groups can be integrated quite well.

A SOCIAL PSYCHOLOGICAL ANALYSIS OF INTEGRATING WOMEN INTO THE NAVY

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This presentation is more speculative than evidential. About one-third of the presentation will be based on empirical data that ought to suggest some things to us.

I think the whole issue of women in the military is simply a part of the issue of larger numbers of women moving into a greater variety of work roles in the general society--although in the military those trends take some unusual forms. I believe it is important that we keep some basic facts in mind, because I sense that we get rather mixed up concerning the issues associated with women at work.

Partly the media are to blame, I think, because of the image that they like to portray of the new career woman as a very glamorous and rising executive with a posh apartment and a nice sports car, but that isn't representative of our concerns. At least, it isn't if we are serious about the issue of greater opportunities for women. In any event, the primary concerns are those of access and opportunities for women.

In the military, the question of women in mainstream roles in large numbers is really generically similar to one that has run through a lot of other things, including the discussion of all-volunteer forces versus the draft. I think that, if I had to phrase it in garden variety words, it would go something like this. Isn't there a pool of persons out there, which we (the military) can draw on in some way, who will be happy with us the way we are, so that we will not have to change anything?

This is a polarizing question, one that leads people to one position or another on these issues. In their answer to this question, I am not sure the services have really bitten the bullet, or, if they have, that they have bitten the right one. I think they have often resorted to alternatives burdened with myths in answering it.

The first myth was the myth of a substantial pool, hidden somewhere out there, of strongly promilitary young men. If we could find the right way to approach these young men, they would be found and all would live happily ever after. However, they are not there in those numbers, and if those who are there were found, perhaps many of them would be undesirable. Therefore, solutions like changing the ad campaign will, in all likelihood, not solve the problem.

A second myth is one I would call the myth of economic curves. It is the notion that, if pay and benefits were simply increased up some known curve to a particular point, the supply problem would be solved. A year later, however, we find that the whole curve has risen or dropped, or civilian pay has changed. Consequently, those rewards that we thought would do the trick prove to have had remarkably short half-lives.

Myth number three is, "All we have to do is to reinstate the draft." I think that, if there were a serious attempt to implement a draft, the college campuses would blow sky high all over again. Finally, myth number four is, "Let's solve the problem by recruiting from the other half of the population we really haven't recruited (i.e., women)." Pursuit of this myth or alternative is likely to change things in the services rather dramatically.

Some of the issues and problems associated with women in the military are generic problems, depending on whether we are talking about civilian society, military organizations, or whatever. I classify these problems into two categories: problems of real experience, and problems of perception or misperception.

First of all, let me take the problems of real experience. It is true that women have been entering the work force in increasing proportions in recent years. I am not sure what the latest percentage is. I think over 50 percent of women are in work roles for pay outside the home. More are working now, but I don't think that they are working or entering work organizations for reasons that would give you any comfort. For example, a large contingent, I think, is made up of 30- to 40-year-old women who have primarily been housewives and who are going back to work now because the kids are in school or are grown, or because of boredom, etc. They are not an answer to any problem faced by the services.

Beyond this, a lot of women who are going back to work are young marrieds who are trying to scrape up enough down payment for a house in today's market, or who are trying to supplement the family income in the face of inflation. I don't think they are going to solve any problems for you.

A new group on the scene in the last half-dozen or dozen years is comprised of young women with very definite and specific career ambitions. They want to be engineers, doctors, lawyers, or business executives. The career and ambition component is not necessarily conducive to, or compatible with, a career in the armed forces. Then, finally, there is what I think is a fairly small subset that is likely to be seriously interested in a military career.

In this light, there are some questions or problems that I think we ought to examine. One thing we don't know a great deal about is the effect of different compositions of work groups. For example, should groups predominately made up of women be supervised and organizationally dealt with differently than groups predominately made up of men? What is the situation in groups I would call balanced (e.g., about 50-50 men and women)? We have no answers to these questions yet, but I have some data I will show you about what we know so far.

If a transition occurs toward a balanced force, meaning a roughly 50-50 male-female mix, or even predominately female groups, will there be the needed leadership skills in the armed services? Will there be the skills necessary to handle misunderstandings, conflicts, stereotypic reactions, and all the kinds of things that are likely to be encountered?

A third set of problems--here I am really wandering far afield from my field into something that a good anthropologist might be able to tell us something about--stems from my impression that, associated with work roles, is a system of role ties, internal and external to the organization, that are quite important to personal identity. They are quite important in preventing stress in work settings, and I think the military situation represents a very specific, structured form of such ties. How will those ties be dealt with?

To elaborate on this, I think the military has taken the main themes of masculine identity and built an entire society based on the kinds of roles consistent with that structure. Then it has built a subsidiary set of roles that encompass other persons related to the prime military role occupant (i.e., wives, children, and other dependents). So, at the center of the structure, you have the military person, historically and principally a male. In his warrior role, he is normally expected to go on expeditions. There is a whole

honorable tradition around this warrior role, with a subsidiary structure in which women have been primarily the back-home spouse, in a dependent relationship to the primary role.

If one thought through that scenario a bit, it would say something like this: The man in that situation is the person whose career or work role is fairly well ordered, is quite compulsory, and has to be adapted to. Everything else is neatly taken care of in relation to that work role.

I think things have moved much farther in the civilian sector than this. My impression is that, so far, women have been integrated into the military primarily in "women's jobs"; that is, into the kinds of jobs that any civilian organization would have occupied with women. That is not the kind or level of change that would come over military organizations if women were integrated into the mainstream roles of the force.

There are some important implications of this, I believe. Right now, a woman in a work group in a civilian organization often has all the ancillary ties of family, children, and the like that go along with her work role. If, for example, little Johnny or Mary has a 104 degree temperature today, and Daddy stays home to take care of little Johnny or Mary, society will say, "That is a concerned father, that's good." The boss at work takes somewhat a dim view of that, but he understands. If it goes on time after time, society, in the form of neighbors or friends or relatives, let alone the people at work, may begin to take a dim view of Daddy.

If Mother stays home because Johnny or Mary has that same fever, it is much more expected, more tolerantly dealt with. Even if the organization that employs that woman decides that they can't live with that kind of schedule, there will be an awul lot of anguish and feelings of sympathy for the woman who has lost her job. However, if Mother drops little Johnny and his 104 degree temperature at the babysitter's house and something happens, that is seen in a very different light. There is an awful lot of social disapproval that goes with that. So, these kinds of ties are going to create, I think, different pressures in the face-to-face work group and the work setting than those with which we are accustomed to dealing.

In the extreme, if you plug into this, say, the Navy work setting, the traditional scene, I suppose, has been something like this: Daddy is shipping out, and Mother and the kids are standing on the pier. It's not fun. It's not pleasant, but it is sort of normal, and it is expected. However, the notion of Daddy standing on the pier with the kids while Mother, seabag over her shoulder, ships out for a year is something I am not sure society is ready to buy. I can imagine that, if large numbers of women were integrated into the Navy and faced with that particular situation, they would simply refuse to go. I would not want to be the CO who orders disciplinary action for that refusal, and I would not want to be the congressman or politician who tries to back him up. We must think, therefore, about the impact of external roles on roles in the Navy, and vice versa.

The outside-the-work role is not just a matter of family. It is also a matter of lots of other kinds of external--masculine or feminine--kinds of role ties instrumental to personality and identity. I am not sure that the military has thought through how to provide those external, identity-providing ties for women that are congruent with the work setting. In short, women in the military might be insulated from a large number of extremely important role ties, and they would find that somewhat debilitating.

Of course, there are other problems not necessarily solved: differences in medical leave, disability requirements, and how to handle pregnancy. Add all of this to the

military's rapid personnel rotation policies, and you have problems not found in civilian life.

For example, in the civilian work organization, a woman becomes pregnant and goes on maternity leave. You hire a temporary replacement, maybe on an as-needed basis, but you do that knowing full well that, in 6 six months, 8 months, whatever it is from now, that woman will be at least a semipermanent part of the face-to-face work group whose continuity is at stake. I don't think that you could have, for example, a rent-a-sailor agency or anything like it that would work in the same situation in the military.

Another issue, and this may be more of a problem for civilian organizations than for military ones, is that there is a rapid personnel turnover, particularly in the case of women managers and supervisors. There is a recognition that women have been shortchanged in those kind of roles, and, in the face of that kind of recognition and of societal and governmental pressures, women are sometimes advanced without the long period of experience that a man would have and without the opportunity to develop the interpersonal networks that are so crucial to effective functioning. So, in one sense or another, when women are promoted into supervisory and managerial ranks these days, they are often set up for failure.

At the same time, women managers, technicians, and supervisors are in very short supply, and so they are much in demand. Often they are promoted, put into a particular position, but then hired, transferred, or lured elsewhere. Both of these situations together probably indicate that there will be rapid turnover of women, and a necessity to replace them. This issue of rapid turnover suggests that one consequence may well be having to overstaff.

Let me throw in another reality problem--certainly a reality problem for the supervisor. There is a notion that leadership is a contingency problem, but I disagree with some versions of that assertion. I don't believe, for example, that there are great numbers of people who are anxious to be treated in an autocratic fashion these days. However, in general, supervision is an adaptive and relative process.

Let's just take one indicator--a questionnaire item in the Survey of Organizations (Taylor & Bowers, 1972). I believe it is also in the Navy Human Resource Management Survey (CNO, 1975). It is the question, "To what extent is our supervisor friendly and easily approached?" It is a general question directed towards describing the supervisor's behavior, even though supervisory behaviors interpreted as friendly may vary from one situation, setting, or kind of group to another.

For example, behavior by a male supervisor to a female subordinate that would be interpreted as being friendly might be quite different from behavior that would be directed to a male subordinate. If you mix in female supervisors and managers and male subordinates, you may change the equation yet again. That is an issue that I think someone has to deal with in terms of integrating large numbers of women into work forces, particularly military ones.

Now let's talk a bit about some issues of misperceptions, work group composition, and their effect on people. There was a small study that Warrington Parker did a few years back (Parker, 1974). He was focusing on the issue of black versus white relationships in work groups, but I think it may be, in principle at least, extendable to gender mixes in work groups as well.

What he did was look at the black-white composition of industrial work groups, along with the race of the supervisor as another variable. While his findings were a bit

complicated for a very small study, they went something like this: If blacks are in a work group where the majority of the workers and the supervisor are white, they will be much more likely to feel that there is discrimination and feel threatened and insecure. If, on the other hand, the supervisor in that same work group is black, those perceptions are much more positive, and the perceptions of the white majority in the group are also a lot more positive. If you have whites in a predominately black group and the supervisor is black, there is some reverse kind of feeling, but not as much as in a black minority, white majority situation. I am not certain how this extends to gender mixes in groups, but I suspect there will be some things like this that we ought to know something about, but about which we don't yet understand.

Another misconception that I hope is soon dispelled is that of the floating brothel. I guess it is understandable that persons would be concerned, but I am not so certain why promiscuity or its possibility has suddenly become such an issue. There is a perception problem, however, which has to be worked on and somehow handled.

I also think there is some possibility of a conflict between what I call the old and new breeds of career women, let alone with the women who were not career women to begin with. I think the older breed of career women have some fairly ingrained ideas that are different from those of women just entering the work force. I think that is going to be a problem.

Now let me turn to a bit of data. Just what do we know about the issue of men and women in the workforce, generally, and what do we know from data we have about men and women in the military, specifically?

A few years back, I believe it was in 1973, we collected two data sets under ONR sponsorship (Bowers, 1975). One of these applied to a representative sample of persons in the Navy; and the other, to a representative civilian cross-section of people aged 15 and over. We collected a lot of information from them, including data on their preferences and values concerning treatment in the work setting, their responses to Survey of Organizations items, and their descriptions concerning treatment in the work setting. We then set about seeing what they told us.

From the Navy sample, we got very little, principally because the number of women that turned up in the sample was very, very small. Probably for that reason, the differences between Navy women and Navy men were not statistically significant and not very meaningful.

We found other things, though, from the civilian sample, and I think they are instructive. One thing we found was that women, more than men, want clean jobs. In other words, we talk about the kind of job the woman says she would like to have. Our findings suggested that she would rather have a job that is at the cleaner end of the scale as opposed to something that is a little bit more on the dirty end of the scale.

Women seem to expect and want more supervisory leadership than men do. Women are much more concerned than men that their jobs involve the presence of friendly co-workers.

More than men, women want jobs that allow them to sink roots in one location. They do not, by and large, want to move around or be in jobs that require them to move around as much as men do.

Women are less concerned that their jobs are seen as prestigious in someone's eyes. They are more averse to bureaucracy and less willing to tolerate it than are men. They

want more independence, and more personal control over their lives than men do, although no one wants an absence of that.

To sum it up, women in civilian life generally want jobs that are cleaner, more clearly directed, less bureaucratic, more settled, and more secure, and they are willing to put up with jobs that are somewhat less challenging, or so it seems. There were no sex differences on the importance of pay or things like that.

Question: What sort of cleanliness are you talking about--dirty dirt or moral dirt?

Answer: It is not moral dirt. It is dirty dirt. It is the difference between someone doing a secretarial job or someone turning a wrench in a greasy factory--that kind of thing.

Question: What about the kind of dirt you would get in the infantry? Is that the kind?

Answer: We didn't ask them that specifically, but I would expect that to be true.

Question: How large were these sex differences?

Answer: In magnitude, they are not overwhelming, but in size and number of cases they are large enough to be truly meaningful. You know, it is obviously not the difference between night and day, but it is a difference that is presumably important.

Now there is one thing we did later on that might be interesting to you. We decided we ought to control for such variables as age, employed versus nonemployed etc., because they conceivably could make a difference.

It was found that controlling for age didn't seem to affect these differences very much. In other words, the differences in responses for women of different ages was essentially the same as the differences for the population as a whole or for men. Controlling for whether or not the woman was indeed employed outside the home in a job for pay did make a difference, particularly on the issues of challenging work and concern about being bossed.

Basically, what it seemed to say to us was, yes, if you ask women respondents in a national survey like this how important it was that they had jobs that were challenging, they interpreted this just exactly as we meant it. In large number, women said that challenge wasn't so important, because many of them didn't want a job outside the home for pay at all. When you took those women out of the picture and compared only employed men and women, the sex difference on those issues evaporated.

We have, in our Survey of Organizations data bank, data stored by group as well as by individual, and we have an item scored 1 or 2 for sex. I thought it would be interesting if I took a mean on a nominally scaled item; that is, one that runs from 1 for male to 2 for female. If the mean ranged from 1.00 to 1.39, we called it a predominately male group; from 1.4 to 1.6, a "balanced group," and from 1.61 to 2.00, a predominately female group. Let's look at the experiences of groups of these different compositions.

We searched through the data bank and found 4366 groups that were predominately male, 1084 that were predominately female, and 389 that were balanced. Now, let me discuss the results on the organizational climate, supervisory leadership, leadership, and the group process and satisfaction indices.

Groups made up primarily of women say that they experienced climates that were better in communication flow, motivational conditions, human resources primacy, and technical readiness, and slightly higher in lower level influence than did groups made up predominately of men.

Looking at supervisory leadership, groups that were predominately female said that they received more supervisory support, work facilitation, and goal emphasis, but no more team building from the supervisor than did groups consisting primarily of men.

In terms of peer leadership, the same or similar kind of pattern was found. Groups that were predominately female said that they experienced more peer support, peer goals emphasis, and peer team building, but no more peer work facilitation than did groups made up primarily of men. In group process and satisfaction, there were no significant differences. In the satisfaction area, however, let me raise some issues.

The satisfaction measure is made up of seven distinct items reflecting satisfaction with the group, the supervisor, the job itself, the company, pay, advancement up to now, and, finally, advancement prospects in the future. On responses to items concerning the group, the supervisor, and the job itself, there were truly no differences between the predominately female and predominately male groups. However, there were differences on responses to the other four items--statistically significant differences. The men's groups were more satisfied with the company and with their pay than were the women's groups. The women's groups were a little more satisfied with advancement prospects for the future than were men's groups. However, on three of the four measures, the highest scores of all were in mixed or balanced groups.

Some other findings are from our all-volunteer Navy study. If you use scales that we have on each of two sorts of belief issues, belief in authoritarian versus participative management practices and belief in the importance of human resources, there are no differences between men and women.

Let me qualify these findings from the civilian data set, because there are some things that may well be misleading. In our data bank, the predominately female groups are likely to be functionally different from the predominately male groups.

It does indeed, look as if the men's groups came primarily from manufacturing settings, whereas the women's groups tended to come from banks, insurance companies, government agencies, educational areas, professional organizations, etc. Fewer of them are in manufacturing, which is, I think, what we would expect.

In the sort of interpersonal organizational work setting they experienced, the women encountered more bureaucracy, red tape, meaningless rules, and endless referrals than did the men. Women clearly said that they have less challenging jobs--the job challenge index was significantly lower for women than for men. Additionally, fewer women than men reported that performance often led to reward. Women were less satisfied; that is, less personally satisfied with the job itself. This is different from our overall satisfaction item. If you ask women, all-in-all, how satisfied they are with their job, they will be much more positive than if you ask them whether they find their job personally satisfying. They have less variety and less freedom in their jobs, but there are some interesting "nondifferences" as well. There is no difference between the male and female groups in whether trying hard makes a difference in doing the work, whether conflicting job expectations were experienced, or whether feedback was received about how well they were doing. On all of these comparisons, however, the balanced groups are the most positive, and that is true on eight out of nine measures. The best situation was balanced groups.

What can we make out of all of this? I am not sure, because organizational function and group function make great differences. We simply haven't looked at that yet, but we can.

Let me speculate here a bit about the future. What will happen as the military attempts to integrate large numbers of women into the service? Well, partly, I think, the same thing that has happened in the civilian world—not much. There won't be dramatic overnight changes because I think women will not come into the military in the numbers you might think, and they won't be in many more job areas than they are now. There will, however, be many problems to handle that are unique to military organizations. For example, if women in the civilian work world have experienced a more positive kind of interpersonal work environment than men have, even if only marginally so, and you take those women and put them into new roles that are in work settings that are interpersonally more like the men's roles, what is going to happen? There is likely to be a very substantial reaction.

If women are integrated into the mainstream occupations in military organizations, you are putting women who have, in general, experienced a more positive work situation, although a less challenging job, into a job that may be somewhat more challenging, but under interpersonal conditions that will be rather abrasive. It is going to take an awful lot of skill and an awful lot of preparation to handle that.

I also think there are going to be substantial problems for the services in trying to handle the external role requirements. There will undoubtedly have to be less protracted absence if you are going to have a large number of women in the service and, at least in the case of the Navy, we will need to watch what that does to the sea-shore rotation of men. Does it mean that the women will have to be primarily on shore duty while the men are primarily aboard the ships? If so, this may create more problems than it will solve.

There is also the advancement crisis problem because of the change in the population mix. People in my age bracket, in their 40s and so on, who were relatively scarce, have been advanced fairly rapidly, and they are going to be around for another 20 to 30 years. Since there are a limited number of slots for advancement open in our organizations nationally, a lot of young people coming on now with high expectations for advancement are going to be blocked. For women, this will be particularly troublesome if they have come to expect that advancement is there.

There is always backlash possible in a situation like this if, indeed, there is inadvertent discrimination against men in some way or another. There is going to be a major problem in developing organizational attitudes and skills that are necessary to cope with the transition. I am not at all sure the military organizations are equipped to deal with this. I think it will take a massive amount of training and on-the-job coaching to develop the skills that are necessary.

One of the things I think it means is that the whole structure of the military organization is going to have to change, even much more than it has so far, toward a more civilianized work setting, one that is less military. That is not going to be terribly pleasant for a lot of people, particularly those at senior levels in the services.

Let me end with some research issues. I think we need some basic research on the experiences and preferences of women and men in mixed-gender settings. For example, I have shown you predominately female and predominately male groups. What about the man who is in a predominately female group? We ought to look at those things, and I think we can. I think we have the data lying around right now to begin to look at that.

We need to know how these experiences and preferences compare for military and civilian settings. We need to assess the changes in organizational skills and practices that are implied by a greater presence of women in military organizations. We need to assess society's tolerance of some of the role relation implications of a shift like this.

We need to know how appealing a military career would be to women generally, under any configuration. You know, we spent generations sort of acculturating ourselves to the notions that women are not in the military, and if they are, they are not in the mainstream part of the military, because they do not do the fighting. Well, how will society react if there is a deliberate change in that?

We need to know how we can generate some options for providing external role identification and involvement sources for women in a military setting. How can we duplicate the ties and involvements that women experience and value in civilian life? We need to study the staffing and the turnover and the rotation implications of integrating women into the force. I do not think they are minor. I think we need to have more flexibility than we think is necessary right now, and perhaps alternative organizational designs to anything we think about now.

Question: What kind of alternative organizations?

Answer: Well, I am not quite sure, but let's play some of it out. Suppose, for example, that there is a major advancement crisis problem coming for military as well as civilian organizations. We plug into this the need to use women more fully and more successfully in military organizations. Perhaps we ought to find ways to accomplish the meaning of advancement without the status pyramid. Maybe it means more matrix organizations. Maybe it means additional responsibility without formal pecking-order implications. Maybe it means more ties of mutual accountability and fewer supervisory-subordinate relationships. Maybe it simply means the presence of money or prerogative.

Question: Do you think there is a need to look at the impact of stress on female or gender-integrated groups?

Answer: I think the notion of looking at gender-variant groups in the face of external physical stress is something that really needs to be investigated. Let me start with this. We spend a long time as a society acculturating little girls and little boys into particular role streams. Now along comes a major kind of societal need or change, and we make some changes. As long as things are reasonably stable, those changes may work, but we know, for example, that supervisors or leaders, under stress circumstances, tend to revert to their preferred pattern of behavior, whatever it was. Now, when the shells start flying, what is going to happen? Is it simply going to trigger highly traditional, highly conventional role relationships that are counterproductive to the task that has to be done? We don't know.

Queston: You brought up quite a number of differences between men and women in the work setting, such as in their preferences, etc. I was wondering how much you personally feel that the differences might result from the fact that, at least in my mind, the woman has an option to leave the work place, while the man is there for life. There is no way out.

Answer: I am not sure that I would state what you just said, or buy it in quite those extreme terms. Women are increasingly in the work force for life, because of families, etc. It is true that, traditionally, the woman has had a job while the man has had a career, but I think that is beginning to get muddied.

Question: Coming back to the issue of stress. You were talking about physical stress. Is there any research, that you are aware of, as to what happens when women are introduced into work groups in jobs that have been physically stereotyped as male jobs, as to the stress that results on the functioning of such groups?

Answer: I would not be a bit surprised if there is such research, although I am not familiar with it. If there is, it probably would be consistent with the general stress literature that deals in terms of unusual events in the life situation. You got married. You got divorced. You lost a parent. You lost a spouse. You got fired. You got a raise. All of those things tend to be associated with increased stress and, over a period of time, with increased likelihood of coronary attacks, etc.

My guess is that, if you suddenly introduce a woman into a situation that is traditionally male, and it is controversial, you are going to see stress and the somatic effects along with it.

Question: My concern is the fact that you are bringing up a lot of things that we ought to be looking into but, from the Navy's point of view, women are going to sea whether we like it or not. It seems that maybe we should have heard you 3 years ago or so. We do not have time to sit back too much and conjecture what might happen. We have to make some positive steps now to sort of bridge the gap, if you will.

Answer: Let me say just a couple of words about that. Women are going to sea, but my guess is, unless I am badly misinformed, that you are not going to have a carrier putting out to sea whose crew is 50 percent men and 50 percent women. You are going to have a few women going to sea on some ships. That is probably even a worse problem because now you have some extremely isolated women on this floating sea of male humanity, and it might be better from the women's point of view if you did have 50 percent women going on some ships.

You know, you are right. These issues should have been faced a long time ago, but they were not. Questions were not even asked.

Question: Can we return again to behavior under stress? Did you say people will revert to their preferred behavior?

Answer: I am not positive who would do what. I do not know whether it would mean that men would insist that all the women got into the lifeboats first, but it seems likely to me that, in situations of extreme trauma, people are going to revert to conventional societal role behavior.

Question: The socially accepted behavior for civilians when shells start flying is to run and hide, but this is not what people are trained to do in the military. Won't training provide the behaviors we want?

Answer: Probably, except that, in addition to training, you have all of the macho little games--cowboys and indians, cops and robbers--and, you know, be courageous and other things that little boys--not little girls--are supposed to do. But, you know, it seems to me, there are some socialization differences between the sexes, and I am not sure what kind of behavior they would push people into. Maybe we could study some of the natural disaster research literature and get some ideas.

Audience comment: I was going to comment on what you are saying. When I was in Vietnam, there was an Army advisor who was out with a Vietnamese Army unit when they

were attacked by an all-woman unit. He knew it was his bullet that had killed one of them. When he came back, the flack he got from the other Army officers, all of them male, was unbelievable: "You shot a woman. My God, what were you doing shooting at women?" It did not matter to them that he was being shot at by the women. We are dealing with strongly ingrained values in this.

Question: From what you have been saying, it seems to me that the changes that have forced the military to put women into nontraditional jobs or combat situations are due to ERA, women's liberation, and manpower (insufficient number of volunteers) considerations. These considerations do not seem to reflect adequately the views of men and women in the United States as to the role of women in the military. Further, the women currently in the military do not seem to see themselves going into combat situations. I think the problem is that we seem to be pushed forward by groups like the ERA supporters. Do the pressures for changes in the military seem to be coming from groups that do not adequately reflect what people want to have happen?

Answer: I am not sure how far into that quagmire I want to get. I would not blame it on the ERA specifically. I think it is, at least in part, a matter of the hotness of the issue, and the desperate need in the military for man (and woman) power, and the fact that we have not thought through the likely limits on integration of women into the military and society's tolerance concerning that integration--I think that is the critical issue in this. I think society will not tolerate some of the possibilities, and not just because there are certain things people think women should not be required to do, although that is one part of the potential resistance. Resistance will also come because military roles infringe on other roles women are expected to have.

I think there is also a situation factor in the limits on integration of women into the military. If the country were literally under attack, a lot of these attitudes would change very dramatically. Maybe not permanently, but at least temporarily. Short of that, I believe there would be some public uproar if women were, in large numbers, involved in combat in a war setting.

Question: What I am hearing you say is that there are certain traditional values in society inhibiting the full use of women in the military. It seems to me that those values may change very quickly if our experience with using women in nontraditional roles is reasonably successful.

Answer: I think that, if it is successful, you will find movement in public attitudes. I do not think it will be a massive movement. I think it will be a gradual expansion of the kinds of jobs women are expected to occupy, but I suppose that, if I were thinking of demonstrated successes that could be widely publicized, I would not place my bet on long shots. I would move a little at a time, and get some success, rather than have the ship steam out of port 50 percent female, 50 percent male, which I do not think is likely to happen anyway.

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NAVY WOMEN IN MIXED WORK GROUPS: SOME PERSPECTIVES FROM ORGANIZATION THEORY AND SMALL GROUP BEHAVIOR RESEARCH

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Introduction

I am sure that everyone recognizes that a number of new national policies, DoD policies, and Navy policies have created dramatic changes in personnel management. Affirmative action programs, equal opportunity programs, the Z-grams, the all volunteer force, and now the policy of increased use of women have all brought revisions to the traditional organization and management of the Navy. Change and transition, but not necessarily full acceptance and implementation at the operating level, describe Navy management over the past 10-15 years. The full implementation of these policies will undoubtedly require at least another 10-15 years, and create periods of difficulty.

With regard to increased use of women, a brief look at some data is extremely instructive. Starting in 1972, the number of women in the Navy began to increase. Between 1972 and 1976, it quadrupled from about 5,000 to 20,000. Also, job opportunities for enlisted women have increased. One of the serious problems in this change in opportunities is that women who enter nontraditional jobs (for women) may attrite at higher levels than men.

I believe these are the kinds of data that indicate that Navy personnel management is and will continue to be faced with increasing numbers of manpower and human relations problems, as well as medical problems. I will discuss these data later, but I suggest at this point we probably will not see any greater emphasis on human relations at the policy level. However, there will be much greater attention to human relations at the command level because of the operational problems that are going to be generated.

Small Group Behavior Research

What is the status of small group behavior research? One way of answering that question is to look at the number of publications, which is a common measure of scientific progress. There is a standard reference work in the area called Handbook of Small Group Research (Hare, 1962). In the 1976 first revision of this book, more than 6000 references were included, compared to approximately 1400 in the 1962 edition.

Another measure is the annual publication rate, which is now running about 200 publications a year on the subject of small group research. This high rate obviously creates different kinds of problems. One is that you have the problem of integrating this large volume of information in some meaningful way, trying to draw out generalizations, or what are sometimes called propositional inventories, that can be applied to real-world problems.

The second problem is that you have deficiencies in research methodology, experimental design, etc., and an absence of new theoretical approaches. All of which is to say that some "facts" as we call them, are highly questionable. Nevertheless, there is a solid body of knowledge available for application and for guiding further research. We need only to be careful in determining the risks involved; that is, we need to apply rigorous assessment approaches in evaluating results.

Let us take a brief look at the historical substantive developments in small group behavior research. The developments parallel quite closely those of psychology, particularly social psychology, and certain areas of sociology. From the earliest times (1898--1905), the concern has been with whether the group makes any difference for the individual working on problem solving tasks. What kinds of problems are best solved by individuals and by what kinds of groups? Also, is individual activity significant in the face of group pressures to conform to some set of norms that the group demands?

Between 1905 and 1920, practically no research was conducted in this area. The period of the 1920s to 1930s was one of rapid growth, with emphasis on the facilitating effect of co-workers (i.e., how coworkers can help an individual's performance). Most of the contemporary concerns of small group behavior research began in the 1930s and the 1940s, and have to do with sociometric investigations, group work and performance, social integration, and group dynamics.

From the 1930s to the early 1960s there were three main schools that dominated small group behavior research: (1) sociometry--Jacob L. Moreno (Moreno, 1941, 1960), (2) group dynamics--mainly starting with the works of Kurt Lewin (Lewin, 1950), and (3) small group interaction process analysis--Robert Bales (Bales, 1950a, 1950b, 1970), which is very important for understanding team development and performance. I would like to talk about some selective technical areas and some specific findings that may be of significance in talking about small groups in general, as well as about mixed groups.

Generally, theoretical work in small group behavior is divided into two types. One type is the experiential, which uses natural observations and subjective analysis and focuses on things like T-group training, interpersonal trust, and social facilitation. The other type is experimental, where one finds studies of group productivity and use of quantitative analysis.

Let us look now at some of the specific variables that people in small group behavior have been concerned with, especially with regard to structures and situational characteristics. (Structure usually refers to size, organization, interaction, and group composition and processes, whereas situational or environmental topics include group goals and objectives, performance criteria, training, and feedback.)

One important question worth discussing is: "Under what conditions is the group superior to the individual?" Generally speaking, with regard to tasks, group superiority is usually greater on manual tasks or problems than on intellectual tasks. The group loses its superiority in efficiency and effectiveness in cases when no division of labor is required, the problems of control are too great, or the group develops a standard of productivity that is lower than that of separate individuals. In terms of man-hours, the individual is usually more productive.

Accuracy of reporting is another important variable in many operating areas (e.g., CIC, sonar, and other surveillance systems). Because of the tendency to converge on a norm, groups will report fewer but more accurate facts than individuals. Accuracy of judgment is an important related factor. As a by-product of group discussion, the individual tends to be more accurate in his own judgment after he has heard the judgment of others--a fact that speaks well for the expanded use of groups.

Another important phenomenon that exists is the "risky shift" phenomenon. Under some conditions, individuals will make very conservative decisions when they are functioning alone but shift to a more risky approach after taking part in group discussion.

This risky shift phenomenon is likely to occur when (1) the group's discussion provides relevant and persuasive arguments, (2) the decision responsibility has been diffused over the group rather than centralized, (3) other group members approve risk taking, and (4) the team leader or group seems to desire a risky outcome. This risky shift is probably one of the best documented examples of the difference beween individual and group problem solving.

Another important question is: "What general conclusions can be drawn as to what characterizes productive groups?" Let me mention some of these. Most productive groups, like most productive individuals, are those that can best follow a process in carrying out a particular task. For example, one of the important requirements for good electronics troubleshooting is to be able to follow the steps in the process, regardless of which strategy of troubleshooting you are using.

Groups that have a structure suited to their function and have high morale based on a large number of intergroup friendships will be motivated to try harder and will be the most productive. Friendship is a very important factor in small group behavior.

Attitudes are important in motivation, and the motivation of the group is lowered if some members show indifference and neglectful attitudes to their tasks.

Group organization is another very important variable. Organized groups can be viewed as being more productive than informal groups--not only because they have better procedures for solving tasks and interpersonal problems, but also because the positions of the members in the group are relatively stable, and less time is wasted in status struggles among the members.

Studies of self-perceptions of groups indicate that productive groups tend to be aware of the characteristics that make them effective. They know when they are good, and this has often been found in studies of airplane crews, pilots, etc.

In studies of ineffective and effective combat crews, sometimes you will find no difference in performance scores, the manner of team performance, or the members' perception of their group interaction. What you do find, usually, is that, in more effective groups, you can demonstrate better use of manpower, greater participation by the members, better coordination and control, and higher flexibility. What this says is that it is very important, in talking about effectiveness and noneffectiveness, to consider the multiplicity of criteria that need to be applied. In many of the studies done on small group behavior, as in behavioral science work generally, only a small number of variables were studied simultaneously, and only a small amount of variance has been explained.

Another variable that has been studied to some degree is intermember relationships (e.g., competition vs. cooperation). Here you find that high productivity in particular task areas is not always associated with good intermember relationships. High productivity may sometimes be gained only at the expense of these relationships.

Many studies have been conducted on competition and cooperation within groups. Perhaps the most general thing we can say is that competitive groups are usually less efficient and less satisfying to members of the group.

Let me say a little bit about authoritarian leaders because they are important in military environments and bureaucracies. Groups led by authoritarian leaders generally show results similar to competitive groups since, in these groups, all members are in

competition for status in the eyes of the leader. Productivity is higher and morale lower than in groups led by democratic leaders, although in some research no differences are reported in the variations of the two styles. In general, the quality of production, rather than the quantity, is higher for cooperative groups.

There have been some recent studies investigating whether men are joining the Navy to get out of debt, to obtain paying jobs and job security, and to seek social interactions. Now, what can we say about this? One of the things you can look at is what is sometimes called "self-oriented needs." What we find here is that, in groups in which most members have high self-oriented needs rather than an interest in working towards a group goal or the solution of the group's problems, average member satisfaction goes down along with productivity. Members of groups high in self-oriented need-expression also tend to perceive the group as less unified. These groups are usually rated as having more interpersonal conflicts and being more productive, but take a longer time to complete their work.

Related to this variable is something that is referred to in the literature as compatibility of affectual orientation. What that really means is compatible feelings and emotions. If there is incompatibility among members in the ability to handle feelings and emotions, productivity and control will decrease in an organization.

There is a whole series of social characteristics that have been studied. By social characteristics, people usually mean things such as age, sex, roles, time within a group, friends, etc. Let me mention a few findings on these variables that relate to mixed groups. One of the generalizations you find in the literature is that single gender groups are more efficient than mixed groups. That is a very general finding. You also find that men and women perform better in their culturally traditional versus nontraditional jobs. Groups of friends are much more productive than groups of strangers. The duration of membership in a group is very positively related to group productivity or effectiveness. Also, looking at cohesiveness, we find that cohesive groups tend to work harder regardless of any outside supervision or external influence.

In terms of size of groups, it is very important to apply the principle of least group size. We find in almost all tasks, whether they are physical or intellectual, that there are diminishing returns when you increase the number of people beyond some specific size--a size that has to be tailored to the task itself. You have to determine what the optimum size is by the task and avoid excess numbers.

Let me turn to leadership for a minute. In many studies of organizational effectiveness, typical results show that good leadership is a primary criterion for efficiency. Although there is a tendency for groups led by autocratic leaders to produce more, but of a lower quality, than groups led by democractic leaders, there is always higher productivity where a skilled leader is playing the role. In absolute terms, a skilled leader is very hard to replace. It has also been found that, when leadership functions are shared rather than centered in one position, productivity is increased if role differentiation has also taken place. Role differentiation is very important when you talk about the relationship of women in a male-dominated group where the male is the leader. If you do not have role differentiation, then you are going to run into lots of problems in mixed gender groups.

With regard to decision rules used by groups, studies suggest that members of homogeneous groups (in terms of skill, interest, etc.) try to reach decisions that are fair, and that most persons in the group reach their own level of aspiration as a result of the

decision. This may not occur in mixed-gender groups. I will talk more about that in the last part of this lecture.

Let me turn now to one of the more interesting variables that has been studied: group motives. Group motives have been studied in relation to a number of variables, especially feedback. With group level feedback (as distinct from individual level feedback), the quality of the group's output improves for simple and complex tasks that require considerable interaction; that is, you find improvement in the quality of output as the completeness of the feedback increases. For example, if you get feedback on the score of the group plus feedback on the individual score, you will find that combination much more effective than either type of feedback provided separately.

Also, the performance of individuals who have a stronger need to achieve success is enhanced by more complete feedback. One question is, "Do women have a stronger need for feedback than do men?" I think that is a very legitimate question that suggests several additional questions to which we need answers.

I mentioned earlier that Robert Bales started a very important methodological movement; that is, the study of interactions within groups. There have been some very important findings from that research and it has, as far as military teams are concerned, not been given enough consideration. Let me explain some of the kinds of things that have been found about interaction in groups.

If you look at the question of what patterns of interaction go on when a team or a group is functioning, you find that you get what is called an assembly effect bonus. Patterns of interaction develop that produce better outcomes over time than you are able to initially generate. There is a pattern of activity that goes on that helps performance to improve. This is very important in the sense that you also find that, when you try to predict the task success of the group, the group interaction measurement that you take is much better in predicting success of that group than is task relevant knowledge or prior training procedures. Predicting operational performance has always been a very difficult problem. What people have found on the technical level is that, if you can successfully measure this interaction affect, you can get good predictions of group performance. That is a very important breakthrough.

In concluding this section of my lecture, let me contrast the definitions of teams usually found in military personnel and training with the definition of groups in the scientific literature. I do so to suggest that the often quoted deficiencies in the theories and technology of team training will remain until there is an integration of the two technical areas.

Let me cover these very quickly. Usually, what you find in the literature is the following. Teams have these characteristics: (1) they are goal or mission-oriented, (2) they have a formal structure, (3) the members have assigned roles, and (4) they require interaction among members.

In the small group behavior literature, these are the kinds of group characteristics you find:

1. Members share one or more motives or goals that determine the direction of the group, and satisfaction of personal goals is a necessary condition for group participation.

2. Members develop a set of norms that set boundaries for interpersonal relations and activities, and conformity is necessary at all levels to solve problems.

3. A set of roles becomes stabilized as interaction continues in a group and as the group becomes differentiated from other groups

4. A network of interpersonal attraction develops among members.

You can see that the list about teams is limited and the list concerning groups addresses a whole series of additional variables. Somehow these lists have to be merged.

I would now like to say just a little about group (team) development and the process of group development. One of the efforts to describe stages in group development, as I mentioned, was the interaction process analysis work of Robert Bales. He noted in his research that the dominant content of interaction changes, as groups move from phase to phase in carrying out their tasks. He talked about these phases very simply in terms of information collection, information evaluation, and pressing for decisions. He observed that, as the phases progress, less time is spent in task behavior and more time is spent on social-emotional behavior.

Several researchers followed him, who expanded the number of phases and the variables involved (c.f., Bennis & Shepard, 1974; Mann, 1966; Mills, 1970). Also, Bruce Tuckman (1965), at the Naval Medical Research Institute in Bethesda, MD, consolidated a lot of the research on development sequence in small groups and came up with a model, although it is incomplete. I think it can best be described in his own terms: "Groups are forming, storming, norming, and performing." What he was saying was that when you bring people together, there is testing and a kind of dependence assessment. Then intragroup conflict develops, followed by group cohesiveness. Finally, you sort out functional roles, develop relationships within the group, and begin to function. He also showed how these stages relate to task behavior.

Now, consider the fact that, in the military personnel business, most enlisted men and women come into the Navy at 17 or 18 years of age, have at most a high school education, and generally have no work experience. After boot camp, they may go to an "A" school or they may go to a fleet or shore assignment. Thus, it seems that something more is necessary to integrate these young people successfully into effective teams than may be going on at the moment. I would think that one of the effects of bringing more women into the Navy is that it will create, perhaps, a situation in which much greater attention will have to be given to developing more effective teams.

Mixed Groups

Let me move on to the next part of my lecture and discuss mixed groups. Sometimes when the term mixed group is used, especially today in the military, it refers to groups composed of males and females as distinct from all-male or all-female groups. However, for the small group behavioral scientist, sex is only one of many distinguishing characteristics. As we have discussed, other characteristics include age, physical attractiveness, social class, ethnic background, etc. However, turning to the matter of sex role research, studies have shown that there are relevant differences between men and women generally in the following areas: (1) self concepts, (2) behavior in groups, (3) attitude toward work, and (4) behavior in work situations.

Here are some of the major findings that were summarized by Navy CDR Doris Vail (1978) in a recently completed doctoral dissertation:

1. The majority of men and women see themselves in the traditional sex role stereotypes found in our culture.

2. Both men and women value masculine characteristics more highly than they do feminine characteristics.

3. Women tend to be less competitive, less assertive, less communicative, and more reluctant to assume leadership roles when functioning in mixed-gender groups than are men.

4. In general, society believes that there are certain kinds of jobs for which women and men are best suited.

5. Women attach more importance to congenial coworkers and working conditions, while men attach more importance to economic benefits of the job.

6. Both men and women feel that intrinsic job factors are important.

7. Women tend to be more satisfied than men are with close supervision.

8. Men tend to discriminate against women in work situations, especially if they still hold traditional attitudes concerning the role of women at work.

9. Women in nontraditional occupations may be in a high role conflict situation, resulting in high levels of anxiety.

10. Co-workers of individuals who violate a norm tend to retaliate with hostility or rejection.

Anne Holberg, of the Naval Health Research Center at San Diego, did a study between 1973 and 1975 on two different groups (Holberg, 1978). One group included men and women in traditional Navy jobs; and another, men and women in nontraditional Navy jobs. I believe they covered 40 or 50 ratings. Some of the findings are described below.

In general, women's hospitalization rates during recruit training were higher than men's for nearly all diagnoses. The overall hospitalization rates of women assigned to nontraditional specialties were quite comparable with those for women assigned to traditional occupations, a finding that would not be predicted by the proponents of the theory that sex role conflict can adversely influence an individual's health. This is a very important finding.

Overall, these comparisons indicated that women in nontraditional jobs experienced more infective, parasitic, and respiratory disorders and less pregnancy-related conditions and diseases of the genital and urinary system than did women assigned to traditional occupations. Her report gets down into the specific disease entities.

Women's overall hospitalization rates were higher than men's for the majority of diagnostic categories. Similar to figures in the civilian sector, women had two or three times the hospital rate of men. A very common problem among men, of course, is accidents in the kinds of work they do. Also, there was considerable variability across occupations and pay grades, with women having higher overall accident rates at lower pay grades. However, men's rates were higher for hernias and fractures.

Of special interest was the finding that women assigned to less traditional jobs had the lowest hospitalization rate for pregnancy-related conditions and diseases of the genital and urinary system. This was true for all pay grades except E-5 and E-9. You see, you really have to ask specific questions.

In total days lost over a period of 3 years, mental disorders accounted for the second largest number of days of hospitalization. Several differences between the sexes were noted, such as the tendency for men in all occupations to show higher rates for schizophrenia, alcoholism and drug-related problems. Women, on the other hand, showed substantially higher rates for neurosis, particularly at the E-1 level.

Let me mention some other findings from Vail's dissertation. What CDR Vail was specifically interested in doing was testing Likert's model of effectiveness in mixed-gender work groups and determining what we could anticipate in operational situations based upon available findings (Likert, 1961, 1967). I think you are all aware that the Likert or Michigan model is being used by the Navy's Human Resources Management Program. Very briefly, Likert's model includes three kinds of variables: (1) causal, (2) intervening, and (3) end result variables. The causal variables are factors such as supportive relationships among group members, group decision-making within a multiple overlapping group structure, and high performance goals. The intervening variables are factors that describe the health of the organization, such as loyalty, attitudes, motivation, perceptions of members, communications, etc. Finally, the end result variables include absentee rates or turnover, productivity, cost, and earnings.

Several findings in the literature on mixed groups reviewed by Vail (1978) should be considered in light of Likert's model. For example, women in nontraditional jobs are violating cultural norms concerning the role of women at work. This may create high levels of anxiety for women and hostility by men toward the women, thus harming peer and supervisory relationships.

Since women attach more importance to working conditions than do men, it is very possible that women would sometimes find working conditions too unpleasant to make the kind of commitments to the organization necessary for high productivity. The finding that women are less competitive, less assertive, less communicative, and more reluctant to accept leadership roles in mixed-gender groups makes it very unlikely the Navy will find mixed groups as effective as single gender groups. Use of women may be placing an unresolved problem on Navy management--a problem for which it has no ready solution at the moment.

Another important finding is that satisfaction with supervisory leadership, peer support, teamwork, work facilitation, and group coordinates is high among nonrated Navy enlisted women, but becomes increasingly lower among women in higher pay grades (discussed earlier by P. Thomas). This is the opposite to what we find in males' satisfaction. Women who have gone into nontraditional jobs in the Navy are less satisfied with their supervisors, and they experience more resentment from their male peers; however, they are more satisfied with their jobs than are women in traditional jobs.

With regard to intensity and emotionality in mixed groups, definite differences between men and women in various groups have been found. For example, men in all-male groups divulged very little personal information about themselves, and the conversational themes tend to center around competition, aggression, and superiority. On the other hand, women in all-female groups revealed a great deal about themselves, their homes, their relationships with others, and their feelings. There is a definite closeness and intimacy in all-female groups. In mixed groups, however, discussions tend to focus on work, ways of proceeding, etc., with periods of hesitation and awkardness. In mixed groups, both males and females make greater use of words indicating a kind of defensive style.

Question: Can you describe Vail's study a little bit? Was she using enlisted people in her analysis situations, and was she observing them at work?

Answer: She used two techniques--questionnaires and interviews. That is the way she collected the data, and the interviews revealed a tremendous amount of information.

Vail cites Aries (1977), who found that men in mixed groups talked more about their feelings and referred more to themselves than when they were in an all-male group, and women talked less about their home and their families in a mixed group.

To summarize, Vail found that (1) groups comprised of women in nontraditional jobs are significantly less effective than groups comprised of women in traditional jobs and all-male groups, (2) women in both nontraditional and traditional jobs perceive supervisory support to be considerably lower than do their male peers, (3) all three types of groups--nontraditional, traditional, and all-male--perceive supervisory support to be fairly low, and (4) women in nontraditional jobs have a high level of anxiety.

To emphasize the significance of this deviancy in gender roles (i.e., deviancy from the cultural norm), let me just cite a couple of statistics. First, an example from my own field, women psychologists commit suicide at a rate three times greater than the general population. Second, suicide rates for women doctors are slightly higher than those of male doctors, and four times as high as those for the general population (Kinzer, 1979).

What does this all mean? First of all, I think it means that organizational practices will be significantly affected by the policy of the increased use of women. I doubt that the full impact is, as yet, fully appreciated. I also doubt that the policy of integrating women into the Navy will be reversed, although it is possible that a return to the draft could impact on it. If a return to the draft does not occur, a great deal more attention will be required, not only to the human relations aspect of organizational requirements, but also to readiness and performance, particularly if women's role in combat positions is expanded.

Second, much more is known about small group behavior than what has been applied to Navy teams in team training, development, or team performance.

Third, and finally, our knowledge and understanding of mixed groups is very limited. What data we do have suggest that the use of women in nontraditional jobs may result in serious operational problems as well as personal problems for those women involved. Clearly, there is an urgent need to obtain more valid and reliable information about these problems and to find solutions to them.

Discussion

Question: What you have said is that the mixed group will not do the job as well as a homogeneous group. Has any work been done to see what will happen if you throw in stress?

Answer: I did talk about how some of the positive variables we see operating, such as cohesiveness, friendliness, etc., tend to bring people together. I think the general findings with regard to stress have to do with the degree of stress. Some stress is good. It creates a motivational influence.

Question: I would suggest we cannot control stress. If it is a wartime environment, you cannot exceed certain stress levels without degrading performance. Fighting your

ship approximates maximum stress, and I am suggesting that is something we ought to examine systematically when we consider mixed groups versus all-male groups for that environment.

Answer: I would agree with you wholeheartedly. Individual differences are important, of course, with regard to response to and tolerance of stress, kinds of stress, etc. However, it is not an area where there is a lot of data, especially with regard to military operations, although you would think there would be. One of the reasons is that the laboratory data available are very hard to validate in operational situations. Although you can collect data in the laboratory environment, the transition into an operational environment is extremely difficult. You cannot easily obtain a ship to use for experimental studies because it is too costly, operationally inconvenient, etc. I would agree with you, however, that the area of stress is very important to study. Navy in-house researchers have looked at it from an epidemiological point of view, and have collected descriptive information. For instance, the reason why pregnancies and abortions occur in certain occupational levels but not in others may really be more important than the fact that the pregnancies occur.

Question: I wonder if it is reasonable to suggest that, as more and more groups integrate over a longer period of time, the long-run effect may be positive for mixed group behavior, as opposed to the short run that we are looking at now.

Answer: I do not know this as a fact, but I do feel that is the thinking behind the policy; that is, there is a transition period that the military departments are going to have to go through as mixed-gender groups are introduced into the situation. My only concern is that I don't think people are giving as much attention to the kinds of things we need to know so that mixed-group problems can be resolved in a minimal amount of time and with a minimal amount of effect on the system and the people. How do we use what we know about small group behavior to try to deal with these problems successfully and in a reasonable amount of time?

Of course, a lot of problems are not small group behavior problems. The sexual harassment the women are going through, as reported in Vail's study, is now not a small group behavior problem. I would characterize it more as an administrative problem, requiring firm discipline. Ultimately, group norms may be an important controlling factor.

Question: You mentioned sexual harassment. How were you using that term? On television a couple of weeks ago, they were talking about sexual harassment: "If you do not grant me certain favors, I will terminate your job or make things unpleasant for you." Were you using it in that way?

Answer: Absolutely.

Question: And that is going on within the military?

Answer: That is in Commander Vail's dissertation from the reports on interviews with women.

Question: Wouldn't you say that movement of personnel, so fast and so often, means that you cannot get down to training a team until you get to the unit? What would you propose to do to enhance team training other than use the improved training detachments that circulate through the fleets? Do you have any proposals?

Answer: I think we could do a lot to improve, say, for example, the big antisubmarine warfare (ASW) training facilities that we have, in the sense of dealing with more of the variables that are important in the total operational task. We do the training on a very narrow task concept. We tend not to include the total environment.

Question: Now, are you talking about different ships working together, or just different members of a small group working together?

Answer: Well, I guess what I was using as an example of improvement was sending trainees to an ASW trainer in San Diego or in Pearl Harbor. It seems to me that the substantial aspect of that training can be significantly improved by better definitions of operational problems or scenarios. But, I would agree with you that it is expensive in time and manpower to do team training in an operational environment, and I have heard all the reasons why you cannot do training in an operational environment. I have heard all those reasons for 30 years, but, you know, you still have to face the fact that it has to be done and it has to be done well. I do not have any reply to the argument that the ship does not have the time, or that it has other priorities. I think that the aviation side does better than the surface side, but there is still a lot of room for improvement.

What I am saying is that the small group behaviors we talked about today are important when that team goes back to that ship or wherever it goes. These behaviors are fundamentally important as the team begins to operate and interact, as well as to live on a day-to-day basis. Simply put, we are not doing much team building.

I think it is important to contrast what happens to an officer who comes into the Navy with what happens to an enlisted person. The officer spent 4 years being systematically exposed to a lot of Navy tradition. He has learned to interact with classmates, other naval officers. None of that goes on at the enlisted level. The enlisted person is thrown on a ship after some period of time in boot camp and maybe class "A" school, and about all he knows is what he learned in those programs.

Audience Comment: I think that some senior women are committed to integration, but they realize they are not going to be able to do it themselves. The women who are younger and have just come in can sort of see opportunity just out of reach, and they are going to organize and try to get it. I know of a lieutenant commander that would like to go on board ship and do some of the things that she has seen the men handle. What women naval officers have right now, in the line officer community, is sort of a mish-mash of different types of jobs, billets, etc.

Answer: I have been curious myself about what Navy women officers are going to do during this integration, because some of the people I have talked to suggest that some of the younger women officers tend to be feminists, and possibly interested in organizing, whereas some of the senior women officers have already been absorbed by the system and are not very likely to take a strong position on the role of women within the military environment.

I worked on the question of career planning for naval officers several years ago. At that time, there was an interest in designing a system that would take into consideration the needs of both the Navy and the individual. It was supposed to be an elaborate system in which you could computerize the various career patterns, and determine what the alternatives were at different grades, etc. To my knowledge, that kind of system has never been developed.

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POTENTIAL POLICY AND RESEARCH ISSUES

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The overall strategy in this section is to attempt to stimulate thinking concerning policy and research issues associated with the increased number of women in the Navy. The author does not claim that the considerations raised in the following paragraphs are exhaustive, but every attempt has been made to deal with implications of gender integration for the total Navy personnel system. The relevance, for the Navy, of many of these considerations greatly depends upon whether or not sea duty for women remains as circumscribed under current law.

The components and activities in the total personnel system addressed in this section include personnel supply, individual and team training, force management, performance measurement and enhancement, operator-machine relationships, and organizational support. Items applicable to these components or activities are keyed to the person(s) who raised them, or from whose presentation they were inferred.

Personnel Supply

1. As the number and roles of women in the military increases, the enlistment propensities and assignment desires of men and women must be monitored. (Landrum and Bowers)

2. Additional measures of physical capacities need to be included in the preenlistment evaluation process. (Ayoub and Robertson)

3. Marketing strategies must be devised that will attract men and women into Navy occupations where there are shortages. Marketing and recruiting should develop accurate expectations concerning the military mission and life style. (Landrum and Bowers)

4. Career development opportunities of enlisted and officer personnel must be explicated and implemented to increase the number of men and women retained in the Navy. (Landrum, Thomas, and Hunter)

5. The validity of promotion tests should be reviewed. (Landrum and Hunter)

6. First-enlistment loss rates are high for both men and women, particularly for women in nontraditional occupations. Work should proceed on the development of better preenlistment screening and assignment techniques. (Hunter and Thomas)

7. The validity of the ASVAB as a selective device for women should be examined. (Thomas)

8. There may be traits (e.g., aggressiveness) required in certain Navy jobs for which no adequate preenlistment measures are available. Work should be done to identify such traits and develop measures or predictors of them. (Maccoby and Jacklin)

Individual and Team Training

1. The physical training at the Recruit Training Centers must be directed toward developing the capacities required by Navy jobs. (Robertson)

2. Gender-integrated training has some unanticipated and negative consequences. (Landrum)

3. The special training requirements of mid-grade enlisted and officer women who are to be assigned to operational units should be defined and met. (McDonough)

4. Training may be needed to overcome sexually stereotyped behavior in leadership and team member positions. (Collins and Thomas)

5. Young women entering the military will, typically, have taken fewer mathematics, physical science, and shop-type classes than will have young men. Compensatory training should be considered to enable more young women to move into nontraditional skills. (Maccoby & Jacklin)

Force Management

1. Models that relate billets to personnel strengths and flows should allow policymakers to determine the effects of changes in laws concerning the use of women in the military, and to investigate various career patterns for men and women. (Collins)

2. Personnel managers require models that will assist them in handling constraints--such as sex, marital status, physical strength, etc.--placed on assignments. (Landrum)

Performance Measurement and Enhancement

1. Better measures of on-the-job performance are needed. (Thomas)

2. Better measures of unit performance and readiness are required. (Dupuy)

3. Research is needed to develop models of unit effectiveness, particularly combat effectiveness. (Dupuy, Collins, and Bowers)

4. The performances of gender-integrated and single-gender units should be monitored as the number and roles of women in the Navy change. Performance measures would include measures of personnel turnover, reenlistment, and absenteeism, as well as measures of unit readiness or effectiveness. (Dupuy, Bowers, Collins, and Thomas)

5. Is there some optimal sex mix, or range of acceptable sex mixes, within military units? Does it depend upon the type of unit? (Landrum, Hunter, Bowers, and Collins)

6. Steps must be taken to ensure that unit response times meet requirements and are not adversely influenced by family complications. (Bowers)

7. The effectiveness of mixed-gender units under stress (e.g., simulated combat) should be studied. (Bowers and McDonough)

Operator-Machine Relationships

1. The distributions of the sexes on militarily relevant anthropometric variables are different. (Ayoub, Robertson, and Maccoby & Jacklin)

2. On the average, males are physically stronger than females. (Ayoub and Robertson)

3. On the average, women are more flexible than men in terms of reach. (Ayoub)

4. The physical requirements of current jobs (including general military duties) must be assessed, and the requirements of emerging jobs should be monitored and influenced. (Ayoub and Robertson)

5. The design and characteristics of tools, work spaces, and survival equipment should be reviewed. (Ayoub, Robertson, and McDonough)

Organizational Support

1. Dependent care during alerts or deployments is a problem, and will become more of a problem if parents are in the military. (Landrum)

2. Habitability (e.g., space) requirements for males and females may be different. (Ayoub and Robertson)

3. Conflicts between the expectations associated with the roles of wife and mother and the requirements of the role of military service members must be reduced or eliminated to ensure that Navy women will perform at the levels at which they are capable. (Bowers)

4. Attitudes of spouses and families toward Navy life should be assessed and tracked. (Bowers, Collins, and Thomas)

5. The morale and welfare of military families should be subjects of concern. This would include vigilance concerning divorce, alcohol and drug abuse, spouse and child abuse, and child adjustment. (Bowers)

Miscellaneous Issues

1. Societal attitudes toward roles for women in the military should be monitored. (Bowers)

2. The reactions of potential opponents to women in the armed services should be assessed. (Dupuy)

3. The possible impact of women in the armed services upon U.S. foreign policy should be assessed. For example, will the presence of women in combat units decrease, or be seen as decreasing, the probability of the U.S. using military force? (Dupuy and Bowers)

4. Male aggression (e.g., sexual harassment and assaults) toward females should be monitored and means developed to counter it. (Collins)

5. Equal opportunity performance must be monitored. The numbers of discipline cases (e.g., NJPs) must be monitored. (Hunter, Landrum, McDonough, and Thomas)

6. Attitudes of male and female service members toward gender integration, the Navy, Navy careers, etc., must be monitored. (Bowers and Thomas)

7. Women, on the average, may expect more positive, less authoritarian working relationships than do men. Is this true? If so, does it matter? (Bowers)

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